United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

BRIEF FOR APPELLANT
AND JOINT APPENDIX

IN THE

United States Court of Appeals

DISTRICT OF COLUMBIA.

No. 8790

BENDIX AVIATION CORPORATION, *Appellant,*
Casper W. Ooms v.
~~CONWAY P. COE,~~ Commissioner of Patents, *Appellee.*

United States Court of Appeals
for the District of Columbia
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Appeal from a Judgment of the District Court of the United States for the District of Columbia.

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IN THE

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DISTRICT OF COLUMBIA.

No. 8790.

BENDIX AVIATION CORPORATION, *Appellant*,

v.

CONWAY P. COE, Commissioner of Patents, *Appellee*.

Appeal from a Judgment of the District Court of the United States for the District of Columbia.

BRIEF FOR APPELLANT.

JURISDICTIONAL STATEMENT.

1. The plaintiff, Bendix Aviation Corporation, is a corporation duly organized and existing under and by virtue of the laws of the State of Delaware, having its principal place of business at Fisher Building, Detroit, Michigan.

2. The defendant, Conway P. Coe, is the Commissioner of Patents of the United States, is a legal resident of the

District of Columbia, and is sued as Commissioner of Patents of the United States.

3. On October 8, 1940, Jakob R. Frei filed an application for a patent in the U. S. Patent Office for improvements in "Distributor," of which said Frei was the original, first and sole inventor, and said application was assigned Serial No. 360,227.

4. The said application for patent was filed in compliance with the requirements of the laws of the United States in such cases made and provided and in compliance with the Rules of Practice of the U. S. Patent Office.

5. Plaintiff-appellant, by virtue of an assignment from the applicant, Jakob R. Frei, dated October 4, 1940, is the owner of the entire right, title and interest in and to said application Serial No. 360,227 and the inventions disclosed therein, said assignment having been recorded in the U. S. Patent Office on October 11, 1940, in Liber L-185, Page 375.

6. The said application for patent has been passed upon by the Primary Examiner, who on August 4, 1942, finally rejected and refused to allow claims 19 and 20 of said application, which read as follows:

> 19. In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.
>
> 20. In a high tension ignition device, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member

> adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

7. Said claim 19 is identical with claim 18 of U. S. patent No. 2,286,232, issued June 16, 1942, on an application filed by Lloyd H. Scott on January 14, 1941.

8. An appeal was duly taken from the said decision of the Primary Examiner to the Patent Office Board of Appeals, who affirmed the Primary Examiner's rejection of said claims in their decisions dated January 26, 1943, and March 1, 1943.

9. No appeal was taken to the Court of Customs and Patent Appeals from said decisions of the Board of Appeals.

10. Plaintiff further states that the invention defined by said finally rejected claims is new and useful, and was not known or used by others in this country before the applicant's invention thereof, and not patented or described in any printed publication in this or any foreign country before said applicant's invention thereof or more than one year prior to the filing of said application for patent, and not in public use or on sale in this country for more than one year prior to said application, and not patented in any foreign country by said applicant or his legal representatives on an application filed more than twelve months prior to said application for United States patent and not abandoned.

11. On or about July 23, 1943, a Bill in Equity was taken in the District Court of the United States for the District of Columbia in accordance with the provisions of the Federal Laws of the United States, as provided for under Revised Statutes 4915 (Tit. 35 U. S. C. A. Sec. 63).

12. After due proceedings had a Judgment dismissing the complaint was filed in the said District Court on or about April 17, 1944.

13. From the said Judgment the plaintiff, Bendix Aviation Corporation, appeals.

STATEMENT OF THE CASE.

1. The application of Frei, here at issue, contains two claims, numbered 19 and 20, that were entered for purposes of interference with the patent identified as Scott 2,286,232, June 16, 1942. Claim 19 is identical with claim 18 of the said patent, and claim 20 is identical except as to the preamble of the claim.

2. The invention covered by the claims is a casing for the distributor of an internal combustion engine.

3. The claims are directed to the casing and do not include as claimed subject matter either the electrical parts of the distributor or the insulating substances that might be placed in the casing.

4. In addition to reciting elements of casing structure, the claims each contain a phrase descriptive of a function that one element of the casing, a partition, is adapted to perform.

5. The controversy arises over the interpretation that is to be given to the said phrase, which reads as follows:

> "a partition in said casing member adapted to prevent access of gases from the second chamber to the first,".

6. The casing of Frei has the partition, and the partition will perform the recited function better than the partition of Scott from whose patent the claim was copied.

7. *No controversy exists as to the other elements of the claims, all of which are shown in the Frei application.*

8. The District Court refused to allow Frei to make the claims in his application, apparently believing that Scott might use a gaseous dielectric (insulation) under pressure in a chamber of the casing, and that Frei might use a plastic dielectric.

9. Inasmuch as no dielectric of any kind is included in the claims, and inasmuch as the Scott specification does not mention a gaseous dielectric, the appellant believes the decision begged the question and was made in error.

STATUTES AND RULES INVOLVED.

R. S. 4915 is so well known to this Court that it is thought to be unnecessary to print it. It is found in U. S. C. A. Title 35 Section 63.

Rule 93 of the Rules of Practice in the United States Patent Office reads in part as follows:

> "An interference is a proceeding instituted for the purpose of determining the question of priority of invention between two or more parties claiming substantially the same patentable invention and may be instituted as soon as it is determined that common patentable subject matter is claimed in a plurality of applications or in an application and a patent. * * *
>
> * * * The fact that one of the parties has already obtained a patent will not prevent an interference, for, although the Commissioner has no power to cancel a patent, he may grant another patent for the same invention to a person who proves to be the prior inventor."

STATEMENT OF POINTS.

1. The District Court erred in not holding as a Finding of Fact that the Frei application disclosed:

> 19. In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and *a partition in said*

> *casing adapted to prevent access of gases from the second chamber to the first,* said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.
>
> 20. In a high tension ignition device the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and *a partition in said casing member adapted to prevent access of gases from the second chamber to the first,* said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

2. The District Court erred in not holding as a Finding of Fact that Frei's partition 16, because of its inherent structure, is adapted to prevent access of gases from the second chamber to the first.

3. The District Court erred in failing to hold in accordance with the evidence presented on behalf of the appellant that the partition 16 of the Frei casing is adapted to prevent access of gases from the second chamber to the first.

4. The District Court erred in paragraph 2 of the Findings of Fact in treating the insulation as though it were an element of the claim.

5. The District Court erred in paragraph 4 of the Findings of Fact in considering Scott patent 2,286,233, which does not contain the claims in question; and in not finding as a matter of law that disclosure lacking in Scott patent 2,286,232 could not be supplied from an external source. The Court also erred as to paragraph 4 of the Findings of Fact by implying that the partition of Frei would not prevent gases such as ozone from entering the "other" cham-

ber. The Court also erred in treating the claims as though they incorporated means for supplying air under pressure to the chamber in which the cables are housed.

6. The District Court erred in holding in effect that claims 19 and 20 include as an element of the claim an atmosphere of fluid dielectric (insulation) under pressure.

7. The District Court erred in not finding as a fact that Frei had not inserted new matter, and as a matter of law that he could not be denied the right to claim the structure originally disclosed.

8. The District Court erred in not deciding the issues on a basis of the language of the claims.

9. The District Court erred in giving judgment contrary to the evidence.

10. The District Court erred in not stating the law to be that an applicant is entitled to claims covering every use to which his invention could be put.

11. The District Court erred in not stating the law to be that an applicant need not recite all functions of each part of his device in his specification; and that failure to recite a particular function of a part does not constitute a disclaimer of that function if the part is inherently capable of performing the function.

SUMMARY OF ARGUMENT.

1. The claims recite a casing divided into upper and lower chambers by a partition having terminal mountings, and include no other structure as claimed matter.

2. The Frei application discloses a casing having a partition including terminal mountings, and conforms part for part and word for word to the claims.

3. The controversy is not about structure, but about a phrase in the claims that describes a function the partition

is adapted to perform, viz: "a partition in said casing member *adapted to prevent access of gases from the second chamber to the first"*.

4. The dictionary definition of the word "adapt" is examined and found to warrant no such interpretation as given to it by the appellee in his interpretation of the claims.

The Testimony (Joint Appendix, p. 10 *et seq.*) proves the Frei partition better adapted to perform the stated function than Scott's partition. The testimony is unrebutted.

6. The Frei partition is inherently adapted to and capable of performing the stated function of preventing access of gases from the second chamber to the first.

7. The District Court, apparently disregarding the settled rule of law that claims must be interpreted by their own words in the light of the specification wherein they appear, decided the case on statements found in a patent specification not involved in this controversy.

8. The errors in the Findings of Fact are pointed out.

9. The errors of the District Court tend to promote a multiplicity of suits and to throw the rights of the inventors, Frei and Scott, into needless confusion.

10. The appellant Frei has been denied his right to claims commensurate with the scope of his invention.

11. The patentee Scott is deriving an advantage from accidental issuance of his patent to which he is not entitled by the Rules of Practice or the law.

12. The appellee is caught on the horns of a dilemma. Either the claims constituted new matter to Frei, or he already had disclosed the invention covered by them. A holding of new matter is a prerequisite to denial of applicant's right to the claims under these circumstances. No such

holding could be or was made. That constitutes an implicit ruling that there was no new matter and that the basis for the claims is in Frei's application. There is consequently no basis for the Judgment below.

13. The decision of the District Court is contrary to the evidence.

ARGUMENT.

This is an appeal from the Judgment and decision of the District Court dismissing appellant's bill under R. S. 4915, and denying the right of the applicant, Frei, assignor to the appellant, to make certain claims in his application for a patent, Serial No. 360,227, filed October 8, 1940.

The legal problem broadly involved in the appeal is how to interpret patent claims; the problem specifically involved is how to interpret descriptive, non-structural phrases in a patent claim; and one particular problem is whether a phrase descriptive of recited structure brings into a patent claim other structure that is not recited.

Another legal problem involved in the appeal is whether the District Court may ignore and decide contrary to unrebutted testimony.

The problems arose when the tribunals below denied applicant his right to make certain claims in his application.

The Invention Involved in the Claims at Issue.

Since the invention involved in the claims at issue is far simpler than the complex structures shown in the patent drawings and described in the specifications, the attention of the Honorable Court is first respectfully directed to the claims.

A copy of the appealed claims is found in paragraph 6 of the Jurisdictional Statement.

To understand what invention is at issue, let us extract the structure from the claims by reading them phrase by phrase:

Claim 20: "In a high tension ignition device"

By this preamble we know, not what the invention is, but what art the invention relates to; it relates to high tension ignition devices and the first question is whether applicant's invention does so relate. It will be admitted by the defendant that the applicant's invention does relate to high tension ignition devices, so we pursue the claim further, reading its next phrase:

> "the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member,".

That phrase has only one element of structure—"*a casing member*"—so let us pursue the claim to its end to see if the claimed invention has any parts except a casing, because up to this point the claim is met by any tin can large enough to hold the working parts of a distributor.

The claim ends thus:

> "and a partition in said casing member adapted to prevent access of gases from the second chamber to the first,. said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber."

Here we find two more elements of structure—*a partition* including *terminal mounting* as a part of *the partition.*

Consequently, the invention thus claimed is simply this: a casing having a partition with terminal mountings.

Application of the Claims to the Frei Disclosure.

Let us examine the Frei (appellant's) specification and drawings to see if they show a casing having a partition with terminal mountings:

Page 24 (Joint Appendix), line 7 from bottom:

> "In the form shown, the current carrying elements of the distributor are housed, supported and radio-

> shielded by a three-part metallic casing comprising a base portion 10, a central or body portion 11, and a cover 12."

We see therefore that Frei does show a casing, and our next inquiry is whether he shows a partition:

Page 25, line 2 (Joint Appendix):

> "Body portion 11 is cylinder-like in construction and is adapted to be removably secured to base portion 10 by means of a plurality of stud bolts 15, a lateral wall 16 intermediate the ends of said body portion forming the top of a chamber 17 in which the rotating parts of the distributor operate."

Page 28, line 22 *et seq.* (Joint Appendix):

> "High tension current supplied to terminal 43 in a manner to hereinafter appear is distributed during rotation of plate 26 and the parts mounted thereon to a plurality of circularly arranged terminals or electrodes that are connected with ignition devices and which are constructed and mounted in casing member 11 in a novel manner to minimize the possibility of damage and reduce to a minimum the weight of the complete unit, the initial cost and the cost of repair in case of accidental damage."

As shown in Fig. 1, the said terminals 57 and 43 are mounted in the partition 16. We also note that Frei's disclosure conforms precisely to the following words of the claim: "terminal mountings whereby the ends of cables" (61, Fig. 1) "housed in the first chamber" (above partition 16) "may be brought into conducting relation with said rotary distributing member" (51-52) "in the second chamber" (below partition 16).

At this point, we may justifiably pause to express astonishment that the Patent Office and the Court below should have denied Frei's right to make the claim. The structure of the casing of Scott is almost identical with the casing of Frei, and the purpose of the partitions is the same: to provide separate chambers for the cables and the rotary member of the distributor.

Since claim 19 has no more structure than claim 20 and will be included in any decision made respecting claim 20, detailed consideration will not be given it. These claims differ only in the introductory phrases thereof.

The Sources of the Errors of the Tribunals Below.

These errors spring from misinterpretation of the second phrase of the claims in issue, which reads: "and a partition in said casing member *adapted to prevent access of gases from the second chamber to the first*".

The matter in italics is a descriptive phrase relating exclusively to the partition. It simply tells one of the things the partition might do. It does not bring any additional structure into the claim. The claim is still directed to a casing with a partition, but it is stated that the partition is *adapted to* prevent access, etc. Not that it does prevent, or is preventing access, but that it might.

"Adapted" is defined thus: "To make suitable; to fit, or suit; to adjust; to alter so as to fit for a new use; to change by adaptation. Synonyms: comply, arrange, accommodate." (Webster's New International Dictionary.)

It is apparent by definition that the words "adapted to" do not limit the claim to actual performance of the function, but are satisfied if the partition would or could be made to perform it.

Although the claims deal with a casing in its empty condition prior to the complete assemblage of the electrical parts that go in it, we are confronted at this point with a question of fact: viz., will the partition of Frei prevent access of gases from the second chamber to the first?

It is conceded that that question must be answered not by relying on conditions when the upper chamber is filled with an insulating material (because then it might be the insulating material and not the partition that prevented access to gases) but by reference to the structure of the casing and its partition alone. The partition of Frei must itself be adapted to prevent access to gases if the words of the claim are to be satisfied.

Testimony was taken on this point (Joint Appendix, p. 10 *et seq.*) and should be read through at this point. It developed the fact that Frei's partition, alone and unaided, is better adapted to prevent the passage of gases than is the partition of Scott, from whose patents the claims were taken. Frei's partition is tighter and lacks certain loose fittings found in Scott. *The testimony corroborates what is already apparent from the structure described and shown by Frei.* It is the partition 16 of Frei that prevents the passage of gas from chamber to chamber, *not the insulation.* No gas can pass that partition to come into contact with any insulation, regardless of whether the insulation is gaseous, liquid, solid or plastic.

That testimony is unrebutted, and should not have been ignored in the Court below. By the decisions of this Appellate tribunal, such testimony may not be ignored by the Court below, and must be given effect, and since it was not, the decision should be set aside:

> "Where the evidence is all one way, and is not immaterial, irrelevant, improbable, inconsistent, contradicted, or discredited, it cannot be disregarded or ignored by the judge, and if he makes a finding which is contrary to the evidence, an error results, for which the decision must be set aside." (*George* v. *Capital Traction Co.,* 54 App. D. C. 144; 295 F. 965.)

Failure to give effect to that testimony is an error in law warranting reversal.

The District Court erred in directing its attention to the complex devices shown in the respective drawings and to details of structure and function described in the respective specifications, while overlooking the fact that not one of those details was claimed structure. The situation was treated as though the Court was comparing lengthy and complex specifications, and it proceeded to read into the claims structural limitations that were not present. Great stress was laid upon the use by Frei of a plastic insulating medium to fill the upper chamber, and *the use by Scott of a gaseous insulating medium* to fill the upper chamber, although neither inventor's specification is necessarily limited to such use (Joint Appendix, p. 29, line 26 *et seq.*), although the claims in question are directed only to the casing and do not include as an element of the claim any particular type of medium to fill its chambers, and although the Scott patent in issue does not even mention the use of gaseous insulation or, for that matter, insulation of any kind. The Court appears to have been deceived as to what the Scott patent discloses.

The Findings of Fact.

The District Court erred in directing its attention to the different specifications, whereby it read into the claims structure that is not there and created artificial distinctions that have no existence in fact. In order to demonstrate this, the Findings of Fact will be discussed paragraph by paragraph.

Joint Appendix, p. 6: "1". This paragraph is correct except that, in order to simplify the issues, appeal is taken only as to claims 19 and 20.

Joint Appendix, p. 7: "2". The first three sentences are correct. The fourth and fifth sentences are totally immaterial to the issue, are concerned with differences appearing in the specifications and not in the claims, and show the error into which the District Court fell of mistaking a disclosure of the specification for a recital in the claims. The last two sentences are correct.

Joint Appendix, p. 7: "3". Claim 18 is not involved in this appeal. Otherwise this paragraph is correct.

Joint Appendix, p. 7: "4". The first two sentences are correct. The third, fourth and fifth sentences distinguish between the Frei device and the Scott device by stating that in the former "the chamber which contains the distributing cables is filled with a solid insulating material", and that the latter "has no such filling but is an air chamber". Both those statements beg the question since the claims do not include insulating material or filling material and do not depend on their use, and Frei's specification does not *require* the use of a filler but only states that it is *preferable.* (Joint Appendix, p. 29, line 27.)

This Finding of Fact then proceeds: "Corrosive gases such as ozone which are produced in the chamber that houses the breaker and distributor mechanisms, are prevented from entering the other chamber by a partition which separates the chambers", which is correct but, since the statement was made only in relation to Scott's partition, erroneously implies that Frei's partition would not prevent the passing of ozone. All of that statement is wholly irrelevant to the question at issue because such limitations are not in the claims. The claims are solely concerned with the structure of a casing and the adaptability of its partition. The Court erred in attributing such function only to Scott's partition.

The last sentence of that paragraph "4" of the Findings of Fact states that the patent to Scott No. 2,286,233, has a means for supplying air under pressure to the chamber in which the cables are housed, a statement which is likewise irrelevant and immaterial to the question at issue because no means for supplying air under pressure is called for in either claim, **and because patent 2,286,233 is not involved in this controversy.**

Thus it is seen that the District Court decided the issues not on the wording of the claims in the light of the specification in which they appeared, but by reference to a later patent not involved in the controversy.

Joint Appendix, p. 8: "5". This paragraph of the Findings of Fact, to the extent that it refers to claim 18, is not in point, claim 18 having been dropped to simplify the issue. The paragraph errs in stating "the claims at bar call for a partition in the casing for preventing access of fluid from one chamber to the other''. The claims at bar actually call for "a partition in said casing adapted to prevent access of gases from the second chamber to the first''. Claims should be considered on a basis of their actual language, not on a paraphrase of it. When the actual language of the claim is considered, the final sentence of that paragraph, reading "The Frei application does not disclose any such conception and does not support the claims at bar'' is seen to be erroneous.

The Errors of the District Court Lead to Inequitable Results.

The casings covered by these claims will presumably be made by the patentee Scott and by the appellant and sold either with the distributor parts mounted in place or to manufacturers of distributor parts for assembling their particular products. When such casings are put on the market by the appellant, the appellant will immediately become subject to suit for infringement by the patentee Scott and the main question involved during such suit for infringement will be whether appellant made such a casing.

The results of such a suit may be anticipated with reasonable certainty because the meaning of the term "adapted to'' has been considered by Courts and has been construed broadly. For instance, in *Lambert et al.* v. *Williams Lime Mfg. Co.,* 34 FS 617, the question arose whether a claim containing the words "the dumping attachments being adapted to be engaged by the cables for tilting the skip for dumping'' was limited to actual engagement with a cable or some other device for carrying out the function. That situation was comparable to the tissues in this case. The Court held "the claim is not therefore restricted to actual engagement with the cable means of the vehicle or any other device for carrying out this function''. Similarly, claims 19 and 20 are not restricted to conditions in which the passage of gas is being prevented, but only to adaptability to preventing it if the conditions that require it should arise.

To follow the judgment of the Court below would tend to multiply suits, this suit being followed by a suit against the appellant for infringement, and by an appeal on the question whether these claims are applicable to Frei's construction, a substantial duplicate of the question now before this Court.

The Interference Division of the United States Patent Office exists for the express purpose of resolving questions of inventorship. A decision at this time by the interference division on the question of who first invented this casing would lay to rest the possibility of further litigation in the premises. Certainly, in so plain a case, where the structures are almost identical, even to the screw threading of the parts, and where the law applicable is so well settled, the Interference Division of the Patent Office ought to assume the functions for which it was created.

The Rulings of the Court Below are in Violation of Long-Established Principles of Law.

Every applicant is entitled to make a claim that will cover every use to which his invention may be put although its complete capacity is not set forth in the specification and even though some of its uses were not known to him prior to the grant of the patent. (*National Hollow Brake-Beam Co.* v. *Interchangeable Brake-Beam Co.*, 106 F. 693; 45 C. C. A. 544; *Stillwell-Bierce et al.* v. *Eufaula Cotton Oil Co., et al.*, 117 F. 410; 54 C. C. A. 584; *Scott et al.* v. *Fisher Knitting Machine Co., et al.*, 145 F. 915, 918; *Kuhlman Electric Co.* v. *General Electric Co.*, 147 F. 709, 712; *E. H. Angle Regulating Appliance Co., et al.* v. *Aderer*, 171 F. 93, 95; *Kellog Switchboard & Supply Co.* v. *Dean Electric Co., et al.*, 182 F. 991, 998; *Weber Electric Co.* v. *National Gas & Electric Fixture Co.*, 204 F. 79, 93; *Stromberg Motor Devices Co.* v. *John A. Bender Co.*, 212 F. 419;

D'Arcy Spring Co. v. *Marshall Ventilated Mattress Co.*, 259 F. 236; 270 O. G. 347; *Wallace & Tiernan Co., Inc.* v. *Village of Le Roy*, 17 F. (2d) 593.

It is probably true that no principle of patent law is more firmly established. It is obvious, in this case, that Frei's partition is inherently adapted to prevent the passage of gas from one compartment of the casing to the other. Let us look at the Frei structure. The partition 11-16 is a solid member separating the upper chamber from the lower except at the places where the terminals 58 are screw threaded through it. Certainly it will never be contended that the gas could pass through the solid part of that partition. Therefore, the only places where the passage of gas is conceivable is around the screw threads of the terminals. Inspection of the terminals shows that they are constructed like spark plugs in an automobile and it would naturally be presumed that they would be gas tight since no high pressures of gas are involved, because it is known that similarly constructed spark plugs are tight under extreme pressures. The very nature of the construction is inherently gas tight.

Furthermore, it must follow as the night the day, that if Scott's terminals are gas tight the terminals of Frei must be gas tight because they are identical in their method of mounting in the partition. It is beyond reason to say that such terminals used by a man named Scott are gas tight and identically mounted terminals used by a man named Frei are not gas tight, yet that is exactly the position which is taken by the Appellee and subscribed to by the District Court.

Not only is it obvious from the nature of the construction that Frei's partition is gas tight and adapted to prevent the passage of gasses but it has been proved as a matter of fact that it actually is gas tight. Tests were run under very severe conditions with the results that are set forth in the testimony of Walter J. Spengler (Joint Appendix, p. 10, *et seq.*), which ought to be read at this point.

The results of the test are shown in Plaintiff's Exhibit No. 9 which should be referred to in connection with the testimony.

It is not only the rule of this Court that an applicant is entitled to a claim covering every use to which his invention is susceptible, whether the use was known or unknown to him, as indicated in the cases cited above, but it is also the rule uniformly adopted by other Courts. *In re Salomon,* 136 Fed. 2d, 728 (CCPA). Furthermore, it is not the practice of the District Court of the District of Columbia to reject such evidence as that of Spengler, but on the contrary it is their general practice to give full weight to such evidence. *Mills et al.* v. *Coe,* 40 USPQ 330. The decision in this case can have been arrived at only by complete disregard of the testimony before the Court, and the decision is therefore erroneous and reversible.

It is also an established principle of the law that a patentee whose patent inadvertently issues with claims to which he is not entitled does not thereby obtain any advantage. (Rule 93 of the Rules of Practice in the U. S. Patent Office, cited above; *Drey* v. *Peiler,* 53 App. D. C. 35; 287 Fed. 1012; *Lorimer* v. *Erickson,* 44 App. D. C. 503). The effect of the present ruling is to deny applicant the right to his invention because the Scott patents inadvertently issued previously.

As hereinbefore stated, the decision of the Court below was based upon the theory that Scott had described filling the upper chamber of the casing with a gaseous insulating medium and Frei had described filling the upper chamber of the casing with a plastic insulating medium. However, even had the two specifications been in absolute terms so limited, which they are not, the Court below would have been in error because the difference related to extraneous materials to be injected into the casing, and not to the casing itself. The effect of the decision below is to say to the inventor Frei: It is true that your casing is practically indistinguishable from Scott's casing, but we think it right to award him a claim that dominates your casing because he thought of a gaseous insulation to fill his chamber, but you preferred a plastic insulation. The error of the decision is thrown into high relief by the fact that a gaseous insulating medium is actually not described in the Scott patent No. 2,286,232.

It is not thought that such reasoning constitutes good logic or good law, but on the contrary, that any inventor who made a casing corresponding to these claims would be entitled to take his place in an interference designed to determine which of them first invented the casing. It is also thought that strained constructions of descriptive clauses should not be adopted to avoid an interference, but that on the contrary such clauses should be given their plain effect.

In *Padgett* v. *Warner,* 104 F. (2d) 957; 26 CCPA 1403, appellant moved to dissolve on the ground that appellee's disclosure did not support a "retaining means—to retain the cups,—and with the needles free to move longitudinally in the cups,". The drawings in appellee's application showed a slight clearance between the needle ends that would apparently permit a slight longitudinal movement of the needles in the cups, but the application made no reference to such movement and no function was claimed therefor. Appellant further urged that appellee's application did not fairly disclose the functional arrangement as defined by the count. The Court held that since appellee's needles were disclosed in the drawing as free to move longitudinally in the cups, it was immaterial to the issue that no reference is made in appellee's application to such longitudinal movement. Applying the principles of that case to this case, it is immaterial whether the Frei specification described his partition as adapted to prevent the passage of gas; the requirements of the law are satisfied if his partition is inherently capable of preventing it.

In *Brown Mfg. Co.* v. *David Bradley Mfg. Co.,* 51 Fed. 226; affirmed 61 Fed. 972, the following claim was in question:

> "The pipe box provided with a projection *adapted to* cooperate with a spring, weight, or the draught, to rock the said pipe box against or with the weight of the rear cultivators or plows, substantially as and for the purpose described."

The plaintiff's position with respect to this claim was the same as the position being taken by the appellee in the present case, i.e., that "there must be read into the claim a spring or weight, a plow beam and axle, such as are described in the specification". Contrary to this contention, the Circuit Court held:

> "I cannot concur with the counsel for complainant in this view of the claim. In terms, it is a specific claim for a pipe box, with a projection *adapted to* cooperate with a spring . . . . It will be noticed that the spring is no part of the claim. The pipe box must have a projection *adapted to* cooperate with a spring, *that is,* a projection to which a spring can be attached which will aid in rocking the plow upon the axis, or, as the claim says, to rock the pipe box."

The above holding of the Circuit Court was affirmed by the Circuit Court of Appeals, which held as follows:

> "We quite agree with the Court below that the first claim of the patent in suit is not for a combination of the pipe box described with other parts of a cultivator named in the claim or specification, but for the pipe box itself, as a single device, designed and *adapted for use* in the several ways specified. The contrary contention requires that the word 'adapted', as used in the claim, be given *a strained and unwarranted significance.* It is not even approximately synonymous with 'combined'." (Emphasis ours.)

In the case of *Parramore* v. *Stein,* 125 Fed. 19, wherein claims including "adapted to" were in question, the Circuit Court held:

> "The patent is for a hose supporter, and nothing more. The requirement that it shall be *adapted to* be

> be detachably engaged with the corset stud, or with the corset at the point where the corset sections meet, is *merely descriptive.* Evidently, from the claims, a supporter, described as *adapted to* be detachably engaged with any part of the corset, if a duplicate of complainant's device, would be just as much an infringement as is now claimed. Therefore we must, for the purpose of this inquiry, entirely disassociate the question of the place of use or application of the supporter of claimant from the article itself."

The decision of the Courts in *Brown Mfg. Co.* v. *David Bradley Mfg. Co., supra,* was cited and followed by the Court in *New York Calculating Machine Co.* v. *International M. M. Co.,* 285 Fed. 635, wherein the phrase *"adapted for* controlling a series of registers or indicators" was held to not limit the claims in suit to a mechanism to be used with a registering or indicating machine—the claims were held to be sufficiently broad to read on the mechanism defined independently of whether the mechanism was actually used for controlling a series of registers or indicators. Likewise, in *Fruehauf Trailer Co.* v. *Highway Trailer Co.,* 54 Fed. (2d) 691 at 705, the decision in the *Brown* v. *David Bradley case* was cited and it was held that *"the 'adapted' clause* in each of claims 1 and 4 is *only descriptive* and does not make the tractor a part of the combination expressed".

In *Virginia Art Goods Studios* v. *Goldberg, et al.,* 76 Fed. (2) 122, the Circuit Court of Appeals, Second Circuit, held that in a claim specifying "the other pocket being *adapted to* receive a closure", the word "adapted" should be construed to mean "not that the flap pocket is made with the purpose of receiving the flap, but that the flap *can be* put into it".

The rule of law pertaining to new matter throws the inconsistency of the decision of the District Court into strong relief. The rule of law pertaining to new matter is that an applicant may not insert in his application matter not originally disclosed. Under the circumstances of this case a rejection on grounds of new matter is an essential prerequisite to a denial of the applicant's right to make the claims, yet no such position was taken by the Court. Had such a position been taken, it would have been couched in such terms as these: "The applicant has added to his drawing a partition", or "The applicant has added to his specification the following words describing a partition", but no such holding was made by the Court because no such statements were possible. Nothing was added to or deleted from the applicant's disclosure. The claims were made upon a basis of disclosure originally in the case at filing and covered by the original oath.

Had a decision based upon the grounds of new matter been made, it would have been met first as to the fact and then as to the law. The law of new matter is quite as definitely settled as the law of uses and to the same effect, it being the established rule that it does not involve new matter to state properties which are possessed by matter originally disclosed and that it is immaterial that applicant may not have been aware of such properties when he filed the application. (*Ex parte Harris,* 43 USPQ 125; *In re Ruttenauer,* 450 O. G. 504; 73 F. (2d) 492; *Wezel et al.* v. *Alexander Leunis, Inc., et al.,* 6 Pat. Q. 154; *Ex parte Quinn,* 4 Pat. Q. 304; *Electric Storage Battery Co.* v. *Philadelphia Storage Battery Co.,* 211 F. 154).

The failure of the Court below to hold that new matter had been brought into Frei's case is conclusive of the fact that new matter was not brought into it. Since new matter was not brought in, the applicant is entitled to make claims covering everything originally disclosed and every use to which the invention of his original disclosure could be put.

CONCLUSION.

1. The applicant is entitled to a claim of scope sufficient to cover every function that his device is inherently adapted to perform.

2. The construction of applicant's casing and the partition therein is so much like the construction of Scott's cas-

ing and the partition therein, that, if Scott's partition will prevent the passage of gas, it must be true that Frei's partition will prevent the passage of gas.

3. It has been proved by unrebutted testimony that Frei's partition actually does prevent the passage of gas.

4. Every element of structure recited in the claims is found in the casing of Frei.

5. The partition of the Frei casing is adapted to perform every function that the partition of the casing described in the claims is adapted to perform.

6. The objections raised by the tribunals below are unsubstantial in fact and a plain violation of the established law pertaining to such questions. In addition, the decisions of the tribunals below were based upon collateral grounds involving elements not included in the claims and a patent not involved in the controversy and are for those additional reasons unsound.

7. It is obvious from a comparison of the Scott and Frei structures, it is obvious from a comparison of the claims with the Frei device, and it is obvious from the evidence, that the decision of the District Court is in error of fact and in error of law.

8. The appellant therefore respectfully prays that the Judgment be voided, the decision reversed, and such other remedies applied as appear to the Honorable Court appropriate to a final termination of the cause favorable to the appellant.

Loyd H. Sutton,
700 10th St., N.W.,
Washington 1, D. C.,
Solicitor for Plaintiff-Appellant.

Of Counsel:
Dale A. Bauer.
On the Brief:
John L. Seymour.

APPENDIX

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IN THE

United States Court of Appeals

DISTRICT OF COLUMBIA.

No. 8790.

BENDIX AVIATION CORPORATION, *Appellant*,

v.

CONWAY P. COE, Commissioner of Patents, *Appellee*.

Appeal from a Judgment of the District Court of the United States for the District of Columbia.

JOINT APPENDIX.

I.

PLEADINGS, DOCKET ENTRIES AND OTHER PAPERS DESIGNATED.

1 Filed Jul 26 1943

IN THE DISTRICT COURT OF THE UNITED STATES

FOR THE DISTRICT OF COLUMBIA.

Civil Action No. 20594.

BENDIX AVIATION CORPORATION, 30 Rockefeller Plaza, New York, N. Y., *Plaintiff*,

v.

CONWAY P. COE, Commissioner of Patents, *Defendant*.

Bill of Complaint in Suit to Obtain a Patent

The plaintiff herein for its Bill of Complaint alleges:

1. The plaintiff, Bendix Aviation Corporation, is a corporation duly organized and existing under and by virtue

of the laws of the State of Delaware, having its principal place of business at Fisher Building, Detroit, Michigan.

2. The defendant, Conway P. Coe, is the Commissioner of Patents of the United States, is a legal resident of the District of Columbia, and is sued as Commissioner of Patents of the United States.

3. This Bill is filed in accordance with the provisions of the Federal Laws of the United States, as provided for under Revised Statutes 4915 (Title 35, U. S. Code, Section 63).

4. On October 8, 1940, Jakob R. Frei filed an application for a patent in the U. S. Patent Office for improvements in "Distributor" of which said Frei was the original, first and sole inventor, and said application was assigned Serial No. 360,227.

5. The said application for patent was filed in compliance
with the requirements of the laws of the United
2 States in such cases made and provided and in com-
pliance with the Rules of Practice of the U. S. Patent
Office.

6. Plaintiff, by virtue of an assignment from the applicant, Jakob R. Frei, dated October 4, 1940, is the owner of the entire right, title and interest in and to said application Serial No. 360,227 and the inventions disclosed therein, said assignment having been recorded in the U. S. Patent Office on October 11, 1940, in Liber L-185, Page 375.

7. The said application for patent has been duly prosecuted in accordance with the laws of the United States and the Rules of the U. S. Patent Office.

8. The said application for patent has been passed upon by the Primary Examiner, who on August 4, 1942, finally rejected and refused to allow claims 18, 19 and 20 of said application, which read as follows:

18. In a distributing mechanism for high tension magnetos the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid di-electric under

pressure and another chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of fluid from one of said chambers to the other, said partition including terminal mountings whereby the ends of cables housed in the one chamber may be brought into conducting relation with the rotary distributing member in the other chamber.

19. In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

3 20. In a high tension ignition device, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

9. An appeal was duly taken from the said decision of the Primary Examiner to the Patent Office Board of Appeals, who affirmed the Primary Examiner's rejection of said claims in their decisions dated January 26, 1943, and March 1, 1943.

10. That no appeal was taken to the Court of Customs and Patent Appeals from said decisions of the Board of Appeals.

11. The Commissioner of Patents, by the Primary Examiner and the Board of Appeals, contends that the said

finally rejected claims are not readable on the disclosure of said application for patent and are, therefore, not in compliance with Section 4888, Revised Statutes, and also that said claims contain new matter not originally disclosed in said application for patent.

12. Plaintiff disagrees with these contentions of the Commissioner of Patents and contends that the said finally rejected claims are in compliance with Section 4888 R.S., that the subject matter defined by said claims is either fully disclosed in or necessarily inherent in the disclosure of said application as originally filed in the Patent Office, and that said claims are patentable to plaintiff and said applicant.

13. That said claim 19 is identical with claim 18 of U. S. patent No. 2,286,232, issued June 16, 1942, on an application filed by Lloyd H. Scott on January 14, 1941; and, that said claim 18 of said Frei application is identical with claim 16 of U. S. patent No. 2,286,233, issued June 16, 1942, on an application filed by Lloyd H. Scott on April 2, 1941.

4 14. Plaintiff further states that the invention defined by said finally rejected claims is new and useful, and was not known or used by others in this country before the applicant's invention thereof, and not patented or described in any printed publication in this or any foreign country before said applicant's invention thereof or more than one year prior to the filing of said application for patent, and not in public use or on sale in this country for more than one year prior to said application, and not patented in any foreign country by said applicant or his legal representatives on an application filed more than twelve months prior to said application for United States patent and not abandoned.

Wherefore, the plaintiff prays that this Honorable Court decree that the Commissioner of Patents be directed to allow the said claims and be authorized to issue to plaintiff, as assignee of said Jakob R. Frei, a patent on the above designated application, including said claims and such other claims as upon hearing the Court may find patentable.

BENDIX AVIATION CORPORATION

By F. BASCOM SMITH,
Counsel for Plaintiff
30 Rockefeller Plaza
New York, New York

LOYD H. SUTTON,
Solicitor for Plaintiff,
700 Tenth Street, N.W.
Washington, D. C.

DALE A. BAUER,
Of Counsel

* * * * * * * * * *

5 Filed Sep 3 1943

Answer to the Complaint

To the Honorable the Justices of the District Court of the United States for the District of Columbia.

1. Defendant admits the allegations of paragraph 1.

2. He admits the allegation as to his official position but states that, while his official residence is in the District of Columbia, he is a legal resident of the State of Maryland.

3. He admits the allegation of paragraph 3.

4. He admits that Jakob R. Frei, claiming to be the original and first inventor of improvements in "Distributor", filed an application for a patent therefor, which application was given Serial Number 360,227.

5, 6, 7, 8, 9, 10. He admits the allegations of paragraphs 5, 6, 7, 8, 9 and 10.

11. He admits that claims 18, 19 and 20, as set out in paragraph 8, were finally rejected by the primary examiner on the grounds recited in paragraph 11 and that
6 that rejection was affirmed by the Board of Appeals.

12. He admits that plaintiff disagrees with the aforesaid actions of the Patent Office, but denies that plaintiff is entitled to a patent on the aforesaid application, containing claims 18, 19 and 20 thereof, since it is deemed that the said claims are not patentable in said application for the reasons stated in the statement of the examiner in answer to the appeal and in the decisions of the Board of Appeals, rendered January 26, 1943 and March 1, 1943.

13. He admits the allegations of paragraph 13.

14. He admits that Jakob R. Frei, the applicant for said patent, made in his application averments corresponding to the allegations of paragraph 13, but denies that these allegations are sufficient to justify issuing to plaintiff a patent on said application, containing said claims.

W. W. COCHRAN
Solicitor, United States Patent Office
Washington, D. C.
Attorney for Defendant

September 2, 1943

I hereby certify that a copy of this Answer to the Complaint was mailed today, September 2, 1943, to Loyd H. Sutton, 700 Tenth Street, N. W., Washington, D. C., attorney for plaintiff.

W. W. COCHRAN
Solicitor

* * * * * * * * * *

7 Filed Apr 17 1944

Findings of Fact

1. This is an action under Section 4915 R. S. (U. S. C., title 35, sec. 63) in which plaintiff, the assignee of the patent application of Jakob R. Frei, No. 360,227, seeks to have the Court adjudge that plaintiff is entitled according to law to receive patent including claims 18, 19 and 20 of said application.

2. The Frei application discloses an ignition distributor adapted for use in a radio-shielded ignition system for air craft engines. The distributor comprises a casing divided into two chambers by a wall. One chamber contains the cables for the incoming and outgoing current. This chamber as shown in Frei's drawing is filled with a material which, according to Frei's specification, is a suitable insulation substance that is preferably a solid of a pliable nature. The function of the filling material is to obviate
chafing of the cables, to act as an insulator, to pre-
8 vent moisture from entering or accumulating in said
chamber, and to prevent loosening of the screws and bolts which hold the various parts of the distributor together. The other chamber contains the rotating mechanism of the distributor. The terminals for the cables in the first chamber pass through and are supported by the dividing wall.

3. Claim 18 is like claim 16 of the patent to Scott, No. 2,286,233. Claim 19 is the same as, and claim 20 is based on, claim 18 of the patent to Scott, No. 2,286,232. These claims were inserted by plaintiff in the Frei application for the purpose of provoking an interference with the Scott patents. The Patent Office held that the Frei application does not support said claims.

4. The patent to Scott, No. 2,286,232, of June 16, 1942, discloses a distributor mechanism for internal combustion engines. The distributor casing is divided into two chambers, one of which contains the breaker and distributor mechanisms and the other the distributing cables. Unlike the Frei device, in which the chamber which contains the distributing cables is filled with a solid insulating material, the corresponding chamber of Scott has no such filling but is an air chamber. Corrosive gases such as ozone which are produced in the chamber that houses the breaker and distributor mechanisms, are prevented from entering the other chamber by a partition which separates the chambers. The patent to Scott, No. 2,286,233, of June 16, 1942,

has, in addition to the structure just described, a means for supplying air under pressure to the chamber in which the cables are housed.

9 5. The claims at bar call for a partition in the casing for preventing access of fluid from one chamber to the other and claim 18 also refers to an atmosphere of fluid dielectric under pressure in the chamber which houses the cables. The Frei application does not disclose any such concept and does not support the claims at bar.

6. The claims at bar are not patentable on the basis of the Frei application.

Conclusions of Law

1. Plaintiff is not entitled to receive a patent on the Frei application containing any of claims 18, 19 and 20 thereof.

2. The complaint should be dismissed with costs against plaintiff.

DANIEL W. O'DONOGHUE
Justice.

Apr. 17, 1944.

* * * * * * * * * *

10 Filed Apr 17 1944

Judgment

This action came on to be heard at the last term and thereupon upon consideration thereof, it is this 17th day of April, 1944,

Adjudged that the camplaint be and it is hereby dismissed, with costs against the plaintiff.

DANIEL W. O'DONOGHUE
Justice.

Approved as to form:
DALE A. BAUER
Attorney for Plaintiff.

* * * * * * * * * *

11 Filed May 5 1944

Notice of Appeal

Notice is hereby given that Bendix Aviation Corporation, plaintiff in the above-named action, hereby appeals to the United States Court of Appeals for the District of Columbia from the final judgment entered in this action on or about April 17, 1944. Appeal is taken from said judgment only insofar as the same relates to claims 19 and 20 of Jakob R. Frei application for patent Serial No. 360,227.

LOYD H. SUTTON
Attorney for Appellant
Bendix Aviation Corporation
700 Tenth Street, N.W.
Washington, D. C.

* * * * * * * * * *

29 Filed May 29 1944

Order as to Original Exhibits

This cause came on to be heard on motion of appellant that the originals of plaintiff's Exhibits Nos. 1, 4, 5, 8, 9 and 10 and defendant's sole exhibit, used at the trial of the above action, be sent to the United States Court of Appeals for the District of Columbia in lieu of copies thereof, and it appearing to the Court that such original exhibits should be inspected by appellant Court,

It Is Ordered that the Clerk of this Court transmit to the United States Court of Appeals for the District of Columbia the original exhibits as designated by Counsel in lieu of copies.

JAS. W. MORRIS
United States District Judge

Dated May 29, 1944.

* * * * * * * * * *

has, in addition to the structure just described, a means for supplying air under pressure to the chamber in which the cables are housed.

9 5. The claims at bar call for a partition in the casing for preventing access of fluid from one chamber to the other and claim 18 also refers to an atmosphere of fluid dielectric under pressure in the chamber which houses the cables. The Frei application does not disclose any such concept and does not support the claims at bar.

6. The claims at bar are not patentable on the basis of the Frei application.

Conclusions of Law

1. Plaintiff is not entitled to receive a patent on the Frei application containing any of claims 18, 19 and 20 thereof.

2. The complaint should be dismissed with costs against plaintiff.

DANIEL W. O'DONOGHUE
Justice.

Apr. 17, 1944.

* * * * * * * * * *

10 Filed Apr 17 1944

Judgment

This action came on to be heard at the last term and thereupon upon consideration thereof, it is this 17th day of April, 1944,

Adjudged that the camplaint be and it is hereby dismissed, with costs against the plaintiff.

DANIEL W. O'DONOGHUE
Justice.

Approved as to form:
DALE A. BAUER
Attorney for Plaintiff.

* * * * * * * * * *

11 Filed May 5 1944

Notice of Appeal

Notice is hereby given that Bendix Aviation Corporation, plaintiff in the above-named action, hereby appeals to the United States Court of Appeals for the District of Columbia from the final judgment entered in this action on or about April 17, 1944. Appeal is taken from said judgment only insofar as the same relates to claims 19 and 20 of Jakob R. Frei application for patent Serial No. 360,227.

LOYD H. SUTTON
Attorney for Appellant
Bendix Aviation Corporation
700 Tenth Street, N.W.
Washington, D. C.

* * * * * * * * * *

29 Filed May 29 1944

Order as to Original Exhibits

This cause came on to be heard on motion of appellant that the originals of plaintiff's Exhibits Nos. 1, 4, 5, 8, 9 and 10 and defendant's sole exhibit, used at the trial of the above action, be sent to the United States Court of Appeals for the District of Columbia in lieu of copies thereof, and it appearing to the Court that such original exhibits should be inspected by appellant Court,

It Is Ordered that the Clerk of this Court transmit to the United States Court of Appeals for the District of Columbia the original exhibits as designated by Counsel in lieu of copies.

JAS. W. MORRIS
United States District Judge

Dated May 29, 1944.

* * * * * * * * * *

II.

TESTIMONY DESIGNATED.

13 Filed May 24 1944

Walter J. Spengler, called as a witness on behalf of the plaintiff, having been first duly sworn, testified as follows:

Direct Examination

By Mr. Bauer:

Q. 1. State your full name. A. Walter J. Spengler.

Q. 2. Your residence. A. Sidney, New York.

Q. 3. Are you over twenty-one? A. Yes.

Q. 4. Your occupation. A. Executive Engineer of Scintilla Division of Bendix Aviation.

Q. 5. How long have you been Executive Engineer? A. Since 1941.

Q. 6. What were you prior to that? A. Chief Engineer for the same Company.

Q. 7. How long had you been Chief Engineer? A. Approximately since 1928.

14 Q. 8. Where were you born? A. In Switzerland.

Q. 9. Will you state your education? A. I went to grade school, to high school and to a trade school and after some experience in shops I went to a technical college for three years and obtained a degree in electrical engineering.

Q. 10. Where did you attend these schools? A. In Switzerland.

Q. 11. You say that you had some practical experience before your college training. State generally what it was. A. That was shop practice for making tools and electrical apparatus, etc.

Q. 12. When did you come to America? A. February, 1923.

Q. 13. You are now a citizen of the United States? A. Yes, sir.

Q. 14. When did you go to work for the Scintilla Magneto Company? A. I started in February, 1923.

Q. 15. That is, as soon as you came to the United States? A. Yes, a little while afterwards.

Q. 16. Have you worked for any other concern in the United States? A. No, I have not.

Q. 17. Are you a consultant for the United States Government in any capacity? A. Yes, since 1943, I have been Technical Consultant for the War Production Board.

Q. 18. Your salary? A. One Dollar a year.

Q. 19. The Scintilla Magneto Company—what is its business? Is it a manufacturing concern? A. It is a manufacturing concern mostly for ignition devices, particularly aircraft ignition devices.

Q. 20. At the time you first became Chief Engineer of that Company, what were its products? A. The product was magnetos, particularly aircraft magnetos.

Q. 21. Did that include ignition distributors? A. Yes, that includes distributors.

15 Q. 22. What are its products today? A. Scintilla still makes mainly aircraft ignition devices, magnetos, harnesses, spark plugs and distributors.

Q. 23. What were your duties at Scintilla before you became Chief Engineer? A. I was designing ignition devices.

Q. 24. Including distributors? A. That is right.

Q. 25. And you have been associated with the design and manufacture of distributors since 1923? A. The designing since 1924 probably.

Q. 26. In this experience have you had any experience in the molding of insulating parts for ignition devices? A. Yes, sir.

Q. 27. Has that been very extended? A. Yes, molding parts is one of the big items in ignition devices, in designing ignition devices.

Q. 28. You are thoroughly familiar with the molding or manufacture of these parts? A. Yes, sir.

Q. 29. Have you read and are you familiar with the application involved in this litigation, that is, Frei application for patent, Serial No. 360,227, filed October 8, 1940, for Distributor? A. Yes, sir.

* * * * * * * * * *

Q. 42. I show you a copy of the drawings in the Frei application involved, and ask you what the part 58 is? A. Part 58 is a terminal, a so-called terminal, consisting of an insert and a molded dielectric around the insert.

Q. 43. What is the number applied to the insert? A. The insert is numbered 57.

Q. 44. In the Frei application involved here at the bottom of page 6, it says "As shown each of said terminals consists of a conductor 57 embedded in a molded insulator 58." If you were to construct a terminal 57, 58 in accordance with that disclosure, how would you construct it? A. I would mold this terminal in a conventional mold.

16 Q. 45. What materials would you start with? A. I would start with a powder. Most of the molding materials are in the powder form before they are compressed and heated.

Q. 46. Would you explain in detail just a little more how they are constructed? A. Do you want me to describe a mold?

Q. 47. Yes, if you will please. A. A simple mold generally consists of two cavities, two halves, you could split it for instance through the center line, for instance, this way. One half here, one half here.

Q. 48. You point to insulation 58? A. That is correct. You put the insert in the mold between the two halves.

Q. 49. What do you mean by the insert? A. The insert 57.

Q. 50. The conductor 57? A. The conductor 57. You fill the cavity with powder and press the other half down on it to get the compression and at the same time heat the mold so that the material will start to flow and take the shape of the mold on the outside and the contour of the insert on the inside.

Q. 51. Could the insert 57 as shown be placed in the insulator after it has been molded? A. No, it could not. This insert has an undercut and the only way you could get this insert in would be by molding insulating material around it.

Q. 52. Because the insert is sort of spool-shaped it would be necessary to mold the insulation around it? A. That is correct.

Q. 53. Would the pressure applied during the molding process cause the insulating material to have close contact with insert 57? A. The pressure is so high that the molding material makes intimate contact with the surface of the conductor 57.

Q. 54. Would the contact be sufficiently intimate to prevent the flow of gases or fluid between the insulating material 58 and the insert 57? A. That is correct, yes.

17 Q. 55. If it were made in this manner would it be possible to make it so that air would flow through that space? A. No, you just don't get any space because of pressure in molding—all spaces are filled.

Q. 56. It would be impossible to construct that terminal in accordance with the disclosure which I read from the application without making that terminal air-tight or substantially so? A. Yes, it has to be substantially air-tight.

Q. 57. Do you know of any other way that this terminal could be made other than by the method you described. A. No, I don't know of any other way and I don't think it can be made any other way.

Q. 58. On the basis of your experience in this field do you think that if there was any other way you would know about it? A. I am sure I would know about it, yes.

Q. 59. Will you point out how the terminal 57,58 is mounted in the transverse wall 16? A. Wall 16 has a threaded hole and the terminal 57,58 has a thread on the outside and above that thread it has a shoulder which engages the wall 16. Simply thread that terminal into wall 16 until the shoulder makes contact with wall 16.

Q. 60. Does it appear from the drawings that the shoulder has contact with wall 16? A. Yes, it does appear because there is just one line that shows the terminal shoulder and the wall.

Q. 61. The engaging surfaces of the flange or shoulder on the terminal and the surface on the wall 16 has one line and hence intimate contact? A. Yes, that is the way to show intimate contact.

Q. 62. Would it be understood that way by anyone skilled in the art? A. Yes, that is so.

Q. 63. If the terminal is mounted in the wall 16 would it be possible for any air to escape from chamber 17 to chamber 19 or vice versa? A. Could you repeat that question, please.

18 Q. 64. If the terminal 57,58, that is the terminals 57,58, were mounted in the wall 16 in the manner disclosed in the application and if this terminal were manufactured in accordance with the disclosure which I read from the Frei application, would it be possible for air to escape from chamber 17 to chamber 19 through the partition which is formed by wall 16 and the terminals? A. No, there could be no air going through there.

Q. 65. Would that be a necessary result of the construction as you have explained? A. Yes, it is bound to be substantially air-tight because the shoulders make a seal between the terminals 57,58 and the wall 16.

Q. 66. There is another terminal numbered 63. Would the same apply to it as applies to 57,58? A. Yes, that is the same thing.

Q. 67. Have you made any experiments to substantiate the testimony which you have just given, Mr. Spengler? A. Yes, I made some experiments to find out if that was airtight for sure.

Q. 68. What did that experiment consist of? A. It consisted of building a metallic chamber and putting the same kind of insert into the top wall as shown in this application. The chamber was attached to a pressure gauge and a means to put pressure into that chamber by means of a pump and we let that stand for a month roughly and watched the gauge to find out if we lost any pressure or not.

Q. 69. Is this the model to which you have just referred? A. Yes.

Mr. Bauer: I offer in evidence as Plaintiff's Exhibit 8 the model to which the witness has just referred.

Q. 70. Where did you get the terminal, the insulated terminal, which is mounted in this exhibit? A. The terminal is one of the terminals that we used in the building of this device at that time.

19 Q. 71. Was this terminal made up specially? A. No, it was one of the terminals that we actually took out of one of the distributors.

Q. 72. About when was this terminal made? A. The terminal was made some time in 1939 and used on the first model we built of this device.

Q. 73. That is, the device shown in the Frei application? A. In the application.

Q. 74. Is the terminal in Exhibit 8 identical in construction with the terminal 57,58 shown in the Frei application drawings? A. Yes, it is the same thing.

Q. 75. Is it mounted in the model in the same manner in which the terminals are shown in the application drawings? A. Yes, sir.

Q. 76. You say you kept a record of the pressure in this chamber over a period of time. Do you have the record with you? A. Yes, I have.

Q. 77. Will you state what the pressure was on the first day the tests were started to be run? A. The tests started in February 23, 1944, and the pressure was 13.8 pounds at a temperature of 75°F.

Q. 78. Where was that? A. That was in Sidney, New York.

Q. 79. And the altitude in Sidney, New York? A. It is slightly above 1,000 feet.

Q. 80. Will you state for the record what the minimum pressure indicated by the gauge was up to the time you took the exhibit away from Sidney, New York? A. The minimum pressure recorded there was 13.2 pounds on March 11, 1944, when the temperature was 71°F.

Q. 81. Did the temperature affect the pressure indicated by the guage? A. Yes, on cold days.

Q. 82. Did the barometric pressure affect it? A. Yes, it will also affect the gauge reading.

Q. 83. Why is that? A. The gauge simply shows the pressure difference between the inside pressure and the surrounding pressure.

Q. 84. What does the gauge read now? A. The gauge now read 12½ pounds.

Q. 85. Do you have any explanation for the slight drop of a half pound since you brought it from Sidney to Washington? A. Yes, we have sea level pressure here and in Sidney roughly 1,000 feet.

Q. 86. In other words over a period of a month this pressure in the chamber has remained very close to its original pressure? A. Yes.

Q. 87. There has been very little leakage? A. Very little. From 13.8 pounds—and the latest and similar pressure at the same temperature was 13.75.

Q. 88. Does that indicate that that terminal does prevent the access of gas from the inside of the chamber to the atmosphere on the outside? A. Yes, I would say it does.

Q. 89. That terminal was manufactured in the ordinary course of affairs. Was it manufactured without any effort to make it more particularly tight than it would ordinarily have been manufactured? A. Yes, that is right.

Mr. Bauer: I will offer in evidence as Plaintiff's Exhibit 9 the record concerning which the witness has just testified as showing the pressures in Exhibit 8 since February 23, 1944.

Q. 90. As a result of this experiment would you say that if you manufactured the distributor as disclosed in the

Frei application that the partition consisting of the wall 16, terminals 57,58 and terminal 63 would prevent the access of gases or fluids, or both of them, from one chamber 19 to the other chamber 17 or vice versa. A. I would say yes. These terminals make a substantially air-tight seal between the two chambers.

21 Q. 91. And if they were made in accordance with the disclosure and embodied insulating material suitable for this purpose no one would be able to make it without making it tight against the access of these fluids? A. Yes, that is right.

Q. 92. I show you a photostat copy of the drawings of Fig. 1 in Scott patent No. 2,286,232, copy of which is also in evidence as Exhibit 5. Have you read Scott patent No. 2,286,232? A. Yes, I have.

Q. 93. Do you know what the element 100 in these drawings represents? A. The element 100 represents the partition between the two chambers.

Q. 94. How is that partition member mounted in the housing? A. The partition is fastened to the outer housing by means of screws going into the housing in radial direction.

Q. 95. In your opinion would it be possible to mount that member 100 in the cylindrical housing 101 in that manner and have an air-tight joint around the periphery? A. It would be fairly air-tight but not necessarily air-tight.

Q. 96. Would it be any tighter than the structure disclosed in the Frei application for the same purpose? A. In the Frei application the wall is an integral part.

Q. 97. What wall? A. Wall 16 is an integral part of the outer housing.

Q. 98. Could there be any leakage around the wall 16 of the Frei application? A. No, there couldn't be, whereas here in Scott you have a little joint between the two parts.

Q. 99. What in the drawings which you hold corresponds to the terminals 57,58 of the Frei application? A. Its terminal, I think it is 85, no 82.

Q. 100. In the Scott patent on page 5, column 1, it describes the terminals to which you have just referred in the following language: "such bushing is shown at 80"—that is the bushing of the complete terminal 82—"made of suitable insulating material, and may have its outer sur-
face corrugated or petticoated and provided with a
22 bore closed at one end by a perforated conducting
block or plug 81 which is preferably threaded and adapted to engage with a corresponding thread on the shank of an electrode 72. The cable to be anchored in a bushing at 80 is cut off "square", i.e., in a plane at right angles to the cable, and provided with a conducting cap which, when the cable is anchored, is in conducting relation with the cable and is threaded or otherwise formed to engage positively with the threaded tip of the shank of an electrode 72." How could this terminal be constructed, Mr. Spengler, following the disclosure which I have just read? A. This terminal can be molded.

Q. 101. What may be molded? A. This terminal 82.

Q. 102. That is the insulating part? A. Yes.

Q. 103. That is the bushing I think which is numbered 80? A. Yes.

Q. 104. How would you put the plug 81 in this bushing? A. The plug 81 is also molded into the terminal.

Q. 105. Could it be put in in any other way? A. Not if it has any undercuts.

Q. 106. Does it appear to have any undercuts in the drawings? A. On this drawing it appears to be straight from what I can see.

Q. 107. Then would that plug 81 be mounted in the bushing 80 so that no air could get between the plug and the bushing? A. Yes, between the bushing and the molding of the outside it can be made air-tight on that surface.

Q. 108. The same as in the Frei application? A. Yes.

Q. 109. How is the terminal or electrode 72 mounted in that terminal? A. The electrode 72 is a threaded screw and is simply threaded into that terminal 81.

Q. 110. Are there any washers involved? A. There is a lock washer between the terminal 81 and the screw head.

23 Q. 111. Would it be possible to make that screw connection between terminal 82 and plug 81 so that it would prevent access of gas from one chamber to another? A. No, air would flow through the opening of the lock washer and along the thread of the screw.

Q. 112. Explain a little more why there is leakage through a screw thread connection? A. Because the thread on the screw has a flat on top. May I use board here?

Mr. Bauer: Yes.

Mr. Spengler: (Drawing) That is the screw thread in the part 81—in the bushing—the screw thread on the screw fits like this (indicating). There is a flat on the screw.

Q. 113. Will you indicate by numeral where air leaks through? A. The air will leak through here at 1 and through here at 2.

Q. 114. What sort of passage is passage 1? A. This is a continuous passage going like a spiral along the part and down here where the screw head comes on you have a set but here is a lock washer in between.

Q. 115. This is allying to the Scott patent, is it? A. Yes, with a slot here so air can go through the slot and winds itself around the spirals 2 and 1.

Q. 116. Would there be very much leakage through a small thread such as shown on electrode 72 in the Scott patent? A. Well, it all depends on what you call a lot. There will be a substantial leakage because some of the openings are fairly large.

Q. 117. Couldn't it be made without leakage? A. No.

Q. 118. Then would it be your opinion that if you or any one skilled in the art manufactured a terminal as shown in the Scott patent that it would necessarily be less air-tight than a terminal which is manufactured in accordance with the disclosure of the Frei application? A. Yes, definitely.

* * * * * * * * * *

24 Cross Examination

By Mr. Cochran:

X-Q. 150. Mr. Spengler, in your study of the Frei application did you see anything concerning the air-tightness of the joint between the plug member 58 and the portion 16? A. (no answer.)

X-Q. 151. Anything in the specification as to whether this was an air-tight joint or not? A. Not that I recall offhand.

X-Q. 152. The specification does not touch on the matter at all? A. As far as I know it does not.

X-Q. 153. You do not recall anything in the specification as to the shoulder on member 58 contacting with member 16 in a manner to prevent leakage? A. I don't just recall that it was.

X-Q. 154. In other words, your testimony is based on your judgment as to what would happen in a construction like this? A. That is right.

X-Q. 155. In the Frei application did you see anything at all about preventing corrosive gases from getting from the lower chamber where the making and breaking occurs into the upper chamber 19? Anything in the specification about that at all? A. No, I don't recall that it is mentioned.

X-Q. 156. Now in your tests with Exhibit 8, in what condition did you keep this apparatus—where did you have it while under observation? A. In my office.

X-Q. 157. All of the time? A. Yes.

X-Q. 158. Was it subjected to any rapid changes of temperature, etc.? A. No, it was in the office in the corner at normal room temperature variations—not violent.

X-Q. 159. No vibrations such as would occur in an airplane engine? A. No.

Mr. Cochran: That is all.

25 Re-direct Examination

By Mr. Bauer:

Re-D. Q. 160. Has it been known very long that ozone created in a distributor chamber would attack the insulation of cables? A. Yes, that is a well-known fact.

Re-D. Q. 161. Known for how long? A. Ever since I have had anything to do with ignition.

Re-D. Q. 162. Has there been any practice in the construction of distributors since you had anything to do with them to prevent ozone from getting at cables which carried electricity? A. Yes, we tried to keep it away as much as possible.

Re-D. Q. 163. In most distributors is this accomplished? A. In distributors of that construction it is accomplished, yes.

Re-D. Q. 164. What was the usual construction of a distributor prior to these disclosures here? How were the terminals mounted? A. Well, in most distributors it is accomplished—in the conventional distributors the terminal sticks out in free air.

Re-D. Q. 165. What is the construction of that wall between the cables and the rotor in prior magnetos? A. That is made from one molding, instead of a metal part. The whole distributor is molded out of one piece.

Re-D. Q. 166. And has that as a general rule been mounted to avoid gases or ozone from getting to the cables? A. Yes, it does it automatically since the chamber is isolated from the cables.

Re-D. Q. 167. In Scott patent the patentee merely states an old problem which had already been solved? A. Yes, that is right.

Re-D. Q. 168. Here it is merely solved by this construction? Does this construction have advantages over the ones heretofore known? A. Yes, when the distribtuor gets large it is better to make it from metal instead of one molded part. It is more stable.

Re-D. Q. 169. The contact shown between the shoulder on the bushing 58 and the wall 16 of the Frei application—why did you testify that that is substantially air-tight as shown in the drawing? A. Because it is a common way of making an air-tight showing.

26 Judge: He has already testified to that on record.

Re-D. Q. 170. In spite of the fact that nothing specifically is said in the specification, is it your opinion that any man skilled in the art would consider it an air-tight joint? A. That is right.

Re-D. Q. 171. And that there was contact between the shoulder and the wall? A. Yes, that is right.

Re-D. Q. 172. If the device of the Frei application were subjected to the vibrations of an engine, would not they be more likely to fail? A. No, I think the Frei structure is more substantial and consists of less parts. It would stay together better than the Scott construction.

Mr. Cochran: I offer in evidence exhibit for the Patent Office which is a folder I handed out earlier in the day containing copies of Scott patents and the statement of the Examiner on patents.

Exhibits received.

The foregoing is acceptable as an accurate transcript of pertinent portions of the testimony.

W. W. COCHRAN
Solicitor for the Patent Office

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III.

EXHIBITS.

Excerpts from Plaintiff's Exhibit No. 1.

33 **Specification**

To all whom it may concern:

Be it known that Jakob R. Frei, a citizen of the United States of America residing at Sidney, New York, has invented new and useful improvements in Distributor, which invention is fully set forth in the following specification:

34 This invention relates to ignition apparatus, and more particularly to means for distributing electrical current from one or more sources of high tension electrical energy to a plurality of electrical circuits in a predetermined sequence such as in the ignition system of an internal combustion engine.

One of the objects of the present invention is to provide a novel ignition distributor wherein the insulating parts are less subject to damage as a result of changes in temperature and during handling by personnel.

Another object of the invention is to provide novel rotatable means in a distributor for an ignition system having main and booster circuits which comprises parts that may be readily assembled for rotation in either direction.

A further object is to provide a distributor which is adapted to be rigidly connected to both the engine casing and a shielding harness for the outgoing and incoming electrical leads, necessary timing adjustments being made by adjustment of the rotatable element of said distributor with respect to the driving means therefor.

Still another object is to provide a novel distributor which is so constructed that the same is inherently radio-shielded without the addition of special shielding parts.

A still further object is to provide novel ignition distributing means which is light in weight and in which the more fragile parts and the parts having the shortest useful operating life are so constructed that the same may be readily and inexpensively replaced.

The above and further objects and novel features of the invention will more fully appear from the following detailed description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and are not intended as a definition of the limits of the invention, reference being had primarily to the appended claims for this latter purpose.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is a side elevation, mostly in section and with parts broken away, of one form of distributor embodying the invention;

Fig. 2 is a top plan view, partly in section and with parts broken away, of the assembled rotating contact or terminal carrying means of the distributor of Fig. 1;

Fig. 3 is a sectional view of said contact carrying means, the section being taken substantially on line 3-3 of Fig. 2;

Fig. 4 is a sectional detail view taken substantially on line 4-4 of Fig. 2; and,

Fig. 5 is a detail view, partly in section and with parts broken away, showing the novel ventilating means of Fig. 1 on an enlarged scale.

A single embodiment of the invention is illustrated in the drawings, by way of example, in the form of an ignition distributor which is particularly adapted for use in a radio-shielded ignition system such as is now in common use on aircraft engines. In the form shown, the current carrying elements of the distributor are housed, supported and radio-shielded by a three-part metallic casing comprising a base portion 10, a central or body portion 11, and a cover 12. Casing member 10 which is cup-like is provided with a central opening 13 in which a rotatable shaft is journalled and is adapted to be rigidly secured to an engine casing or the like (not shown) by bolts which extend through a plurality of openings 14. Body portion 11 is cylinder-like in construction and is adapted to be removably secured to base portion 10 by means of a plurality of stud bolts 15, a lateral wall 16 intermediate the ends of said body portion forming the top of a chamber 17 in which the rotating parts of the distributor operate. Cover 12 is removably secured to the upper end of body 11 by set screws 18 or other suitable means and forms the top of a second chamber 19 above wall 16. Body portion 11 may also be provided with an opening 20 in the side thereof for the passage of cables from chamber 19 to a radio-shielding harness manifold 21 (only partly shown), which may be of the character illustrated in Spengler et al. co-pending application Serial No. 271,220, or any other suitable type.

For the purpose of rendering the present distributor capable of use in its entirety with engines regardless of the required direction of rotation of the rotatable elements thereof, for the purpose of making it unnecessary to shift the distributor casing angularly for timing purposes, and for the further purpose of reducing the number of failures and delays due to fracture of the molded insulating parts, a novel rotatable mechanism is provided. In the form illustrated, said mechanism comprises a beveled ring gear 22 adapted to be driven by the engine with which the distributor is associated, said gear having a sleeve-like hub portion 23 extending into the inner race of ball-bearings 24 which are mounted in a sleeve 25 having a drive fit in opening 13. A plate 26 of metal or other suitable material in chamber 17 is provided with a downwardly extending sleeve-like hub portion 27 which is freely journalled in the upper end of hub 23.

In order to drivably connect gear 22 and plate 26 together, whereby the former may directly drive the latter and yet provide for small angular adjustments of one with respect to the other, an adjustable coupling is pro-

37 vided which comprises a bolt 28 that has a free sliding fit in hub 27 and splined engagement, as at 29, with hub 23 of gear 22. The inner surface of head 30 of said bolt has an annular series of ratchet teeth 31 cut thereon that mesh with a similar set of teeth 32 cut on the upper surface of a ring or sleeve 33 which freely surrounds bolt 28 for free angular and axial movement relative thereto. The lower face of ring 33 is likewise provided with a series of ratchet teeth 34 which have a slightly different pitch than teeth 31,32 and mesh with a similar set of ratchet teeth 35 cut on rotating element 26,27. In one commercial embodiment, the diameter of head 30 is .695″ and there are 24 teeth on one face of ring 33 and 23 teeth on the other face thereof. By making a shift of one tooth in each set of meshing teeth and in opposite directions, an angular adjustment equal to the difference in the pitches of the two sets of teeth may be accomplished, i.e., an adjustment of less than one degree. The teeth 31, 32 and 34,35 are normally held in mesh, so that gear 22 and plate 26 will rotate as a unit, by a nut 36 threaded onto bolt 28 and engaging the lower face of said gear. When nut 36 is loosened sufficiently to permit the making of an adjustment, a spring 37 yieldably holds the ratchet teeth 31,32 and 34,35 in mesh. These teeth are so cut that when plate 26 is turned in one direction teeth 31 and 32 tend to slip over one another, while teeth 34 and 35 tend to slip over one another when said plate is turned in the opposite direction. Thus, when nut 36 is loosened, oscillation of either plate 26 or gear 22 to the extent of one ratchet tooth in each direction effects a very small angular adjustment between said gear and plate. When nut 36 is tightened against gear 22, a direct drive is formed from said gear through splines 29, ratchet teeth 31,32, ring 33, and ratchet teeth 34,35 to plate 26. It is believed that a more detailed showing or
38 description of the adjustable coupling is not necessary since it does not per se constitute a part of the present invention.

Mounted on plate 26 for rotation therewith are novel means for picking up current from stationary supply leads and distributing said current in a predetermined manner to a plurality of terminals or electrodes to be later described, said means being adaptable for rotation in either direction, less subject to breakage, and more readily and inexpensively replaced than similar means heretofore provided for the same purpose. As illustrated, said means comprises two molded insulating blocks 38 and 39 secured to plate 26 for rotation therewith by bolts 40 and 41, respectively, (Fig. 2) and preferably separated from said plate by a spacer plate 42 of insulating material. Block 38 has a central metallic terminal 43 embedded therein and projecting beyond the upper surface thereof, which is connected by an embedded wire 44 to a disk or contact 45 that is fixed in said block intermediate the ends of a cylindrical passage 46 through the block, the opposite ends of said passage constituting coaxial recesses. Also embedded in block 38 adjacent the periphery thereof is a metallic ring 47 which extends beyond the supper surface of the block and is connected by a lead 48 to a contact disk 49 fixed in a through passage 50 that is parallel and diametrically opposite passage 46.

Electrode carrying block 39 is secured to plate 26 adjacent one end thereof and has a pair of spaced terminals or electrodes 51 and 52 embedded therein and projecting outwardly beyond the periphery thereof, as best seen in Fig. 2. The embedded ends of said electrodes form the inner ends of cylindrical recesses 53 and 54, respectively, which are in axial alignment with passages 46 and 50 of terminal block 38. For electrically connecting electrodes 51 and 52 to terminals 45 and 49, a pair of connectors 55 are
39 provided. Said connectors slidably extend into said recesses and passages and may be constituted by short lengths of insulated cable, each having a coil spring 56 secured to each end thereof. To insure smooth rotation of the rotating parts, the insulating block 39 is balanced

by a counterweight 26a which may be integral with plate 26.

If it is desired to connect terminals 51 and 49 and terminals 52 and 45, i.e., the reverse of the connections illustrated in the drawings, it is only necessary to turn terminal block 38 through 180° relative to plate 26, it being noted, that said terminal block is symmetrically constructed with respect to a plane parallel to passages 46 and 50 and containing the axis of rotation of plate 26. Thus, either electrode 51 or 52 may be readily connected to either ring terminal 47 or center terminal 43 of block 38. This reversability results from making the contact carrying elements 38 and 39 in two parts instead of one and this, in turn, results in the ready and inexpensive replacability of electrodes 51 and 52 when the same become corroded or burned. Also, by making the molded insulating parts smaller in size and with less embedded metal, there is less danger of said parts becoming cracked or broken during manufacture and use, which often occurs by reason of the different coefficients of expansion of the insulating and metallic parts and the shrinkage of the molded insulating material during the drying process.

High tension current supplied to terminal 43 in a manner to hereinafter appear is distributed during rotation of plate 26 and the parts mounted thereon to a plurality of circularly arranged terminals or electrodes that are connected with ignition devices and which are constructed and mounted in casing member 11 in a novel manner to minimize the possibility of damage and reduce to a minimum the weight of the complete unit, the initial cost and the cost of repair in case of accidental damage. As shown, each of said terminals consists of a conductor 57 embedded in a molded insulator 58, which extends through and has threaded engagement with metallic wall 16. The ends of each conductor 57 may be counterbored and threaded for receiving terminal screws 59 and 60. Each of a plurality of cables 61 is connected to one of the annularly arranged conductors 57 and is led out of chamber 19 through opening 20 into shielding harness manifold 21, from whence it is connected, either directly or through other connecting cables, to a spark plug of the engine on which the distributor is used. The lower ends of terminals 57,59 are preferably wholly within casing 11, i.e., above the lower edge thereof as shown in the drawings, to thereby minimize the danger of damage to said terminals when the structure is disassembled.

High tension current from any suitable source of supply (not shown), such as a magneto, is conducted to the distributor through a cable 62 which also enters chamber 19 from harness 21 or other suitable inlet and is connected to a central terminal 63 that is similar both in mounting and construction to terminals 57,58, except that the lower end of the conducting portion of terminal 63 is provided with a movable contact brush 64 adapted to be yieldingly held against terminal 43 by a coil spring 65. A terminal similar to terminal 63, but not shown in the interest of clarity, is provided directly above a portion of ring 47 for conducting high tension current from another or booster source of said ring and, hence, to the trailing one of the electrodes 51 and 52 for use primarily in starting the engine.

In order to minimize the possibility of flash-overs between terminals 60 and the metallic casing 11,12 and to obviate chafing of cables 61,62 by reason of vibration, chamber 19 is preferably filled, as is also manifold 21, with a suitable insulating substance 66. The latter is preferably a solid and yet is of a pliable nature. One substance which has been found suitable is polymerized cashew nutshell oil. The filling of chamber 19 and harness 21 also prevents moisture from entering or accumulating in said chamber and harness.

41 Filler 66 may also be used in a novel manner to lock set screws or bolts, which hold the various parts of the distributor and harness together, against accidental loosening or removal. For example, a portion of one of

two engaging parts, such as manifold 21, may be cut away around a bolt 67, which secures the manifold to casing 11, to thereby form a recess 68 to receive the filling material, preferably around a threaded portion of the bolt. The latter is thereby yieldably held against turning and, hence, loosening of the bolt by vibration is effectively prevented in a very simple manner without rendering it unduly difficult to forcibly remove the same for purposes of disassembly.

Flashovers between casing 10,11 and electrodes 59 within compartment 17 are also effectively avoided in a novel manner. The interior surface of casing members 10 and 11 are sprayed or otherwise coated, for this purpose, with a layer of insulating material 69.

Novel means are provided for ventilating compartment 17, said means being so constructed as to prevent rain and other foreign matter from being carried into the distributor by the air. Said ventilating means, in the form illustrated, are particularly adapted for installations wherein the axis of shaft 28 is inclined to the vertical and comprises an elongated tubular member 70. The latter is curved in the horizontal plane, as shown in the drawings, to fit the contour of casing member 10 and, when the distributor is mounted on an engine, member 70 is preferably tilted with respect to the vertical, so that one end is lower than the other end thereof, either by virtue of its installation in casing 10 or by virtue of the manner in which the casing is mounted on the engine.

The lower end of tube 70 is supported in a fitting 71 that
has a hollow threaded portion 72 which extends
42 through an opening in casing 10 and is secured in
place by a nut 73. The hollow interior 74 of portion
72 serves to continuously connect the interior of tube 70 with the atmosphere. The upper end of said tube, the angular extent of the latter from end to end being something less than a semi-circle, is supported in a similar manner by a fitting 75 that has an opening 72 connecting tube

70 with chamber 17. Fitting 75 is provided with a threaded portion 77 that extends through the wall of casing 10 and is engaged by a nut 78. Compartment 17 is thus continuously connected with atmosphere through passage 74, curved tube 70 and passage 76. In traversing these passages, a substantial percentage of moisture and other foreign particles carried by the air are retarded and caused to drop to the bottom of tube 70 and hence to fall out through opening 74. It will, of course, be understood that more than one tube 70 may be provided and that casing 10 may, if desired, be cast with the ventilating passages therein.

In the operation of the distributor, as assembled in the drawings, high tension current is supplied from a magneto or other suitable source through cable 62, brush 64, terminal 43, contact disk 45 and conductor 55 to electrode 51. As the latter electrode is rotated in a clockwise direction, as viewed in Fig. 2 and in a manner heretofore fully described, the same will move beneath successive electrode points 59 in close relation thereto so that high tension current will flow from the moving electrode to the stationary electrodes and thence through conductors 57 and 61 to the spark plugs or other ignition devices of the engine with which the distributor is used. The high tension current is ordinarily supplied in timed impulses from an induction coil and it is accordingly necessary that electrode 51 pass below the various stationary electrodes 59 in timed relation to said impulses. The necessary positioning of the rotary unit may be effected for this purpose through the adjustable coupling comprising parts 28, 33 and 26 in a manner heretofore fully described.

High tension current may also be supplied to the same spark plugs by an auxiliary or booster source, such as for starting purposes, when the pistons in the respective cylinders of the engine are near their top dead-center positions. The booster current may be supplied by means of a brush contact through ring 47, disk 49, conductor 55, rotatable electrode 52 and electrodes 59. If the reverse direction of rotation is required in a particular engine, thereby making electrode 52 lead electrode 51, the current from the main source of supply may be readily directed from terminal 43 to electrode 52 and current from the booster source directed to electrode 51 by merely reversing the position of block 38 on plate 26. In order to insure proper assembly in the field, a positioning pin 79 may be provided in plate 26 for cooperation with a recess in block 38.

There is thus provided a novel ignition distributor for internal combustion engines which is housed in a novel manner in a metallic casing that may be rigidly and non-adjustably secured to the engine casing and which is provided with internal means for adjusting the movable electrodes with respect to the stationary electrodes thereof for timing purposes. Novel insulating parts are also provided, thereby minimizing the possibility of failure and reducing initial cost as well as cost of repair. There is also provided a novel rotatable electrode and terminal carrying means which may be readily adapted for rotation in either direction and wherein the electrodes, which are subject to wear and errosion during operation, may be readily and inexpensively replaced.

44 Although only a single embodiment of the invention has been illustrated and described in detail, it is to be expressly understood that the same is not limited thereto but that various changes may be made, particularly in the design and arrangement of parts illustrated without departing from the spirit and scope of the invention, as the same will now be understood by those skilled in the art. For a definition of the limits of the invention, reference is had primarily to the appended claims.

What is claimed is:

* * * * * * * * * *

47 5. An ignition distributor comprising a three-part metallic casing forming two chambers and including a base member, a central body member having a lateral

wall constituting a common wall of said chambers and a cover, rotatable means journalled in said base member and including a driving member, a driven member, means for coupling said driven and driving members for angular adjustment relative to each other, an insulating block having a plurality of terminals thereon secured to said driven member, an insulating block having a plurality of electrodes thereon secured to said driven member and means for connecting said terminals to said electrodes, means mounted in said lateral wall for conducting high tension current to said terminals, and a plurality of stationary electrodes individually mounted on and insulated from said wall circularly arranged for successive cooperation with said first-named electrodes during rotation of the latter, said stationary electrodes extending from one of said chambers to the other.

6. In an ignition distributor, a metallic casing having a wall therein dividing said casing into two compartments, a plurality of circularly arranged electrodes extending from one of said compartments to the other though openings in said wall, said electrodes being embedded in electrical insulators, each having threaded engagement with said wall, and rotatable means in one of said compartments including an electrode adapted to successively cooperate with said first-named electrodes.

48 7. In an ignition distributor, a metallic casing comprising a base member, a central body member, and a cover, said body member having a wall therein dividing said casing into two compartments, a plurality of electrodes individually mounted in said wall and insulated therefrom, each of said electrodes extending from one of said compartments to the other, and rotatable means in one of said compartments including at least one electrode adapted to successively cooperate during rotation thereof with said first-named electrodes.

8. In an ignition distributor, a metallic casing having a wall therein dividing said casing into two compartments,

a plurality of circularly arranged electrodes extending from one of said compartments to the other through openings in said wall, said electrodes being embedded in electrical insulators, each having threaded engagement with said wall, rotatable means in one of said compartments including an electrode adapted to successively cooperate with said first-named electrodes, and means for conducting high tension current to said rotatable electrodes including a conductor extending through and insulated from said wall.

9. In an ignition distributor, a metallic casing comprising a base member, a central body member and a cover, said body member having a wall therein dividing said casing into two compartments, a plurality of electrodes individually mounted in said wall and insulated therefrom, each of said electrodes extending from one of said compartments to the other, rotatable means in one of said compartments including at least one electrode adapted to successively cooperate during rotation thereof with said first-named electrodes, a cable connected to each of said first-named electrodes in the other of said compartments, and an insulating compound filling the space in said other compartment around said cables and electrodes.

* * * * * * * * * *

51 In testimony whereof I have signed this specification.

JAKOB R. FREI

* * * * * * * * * *

of drawing as originally filed.

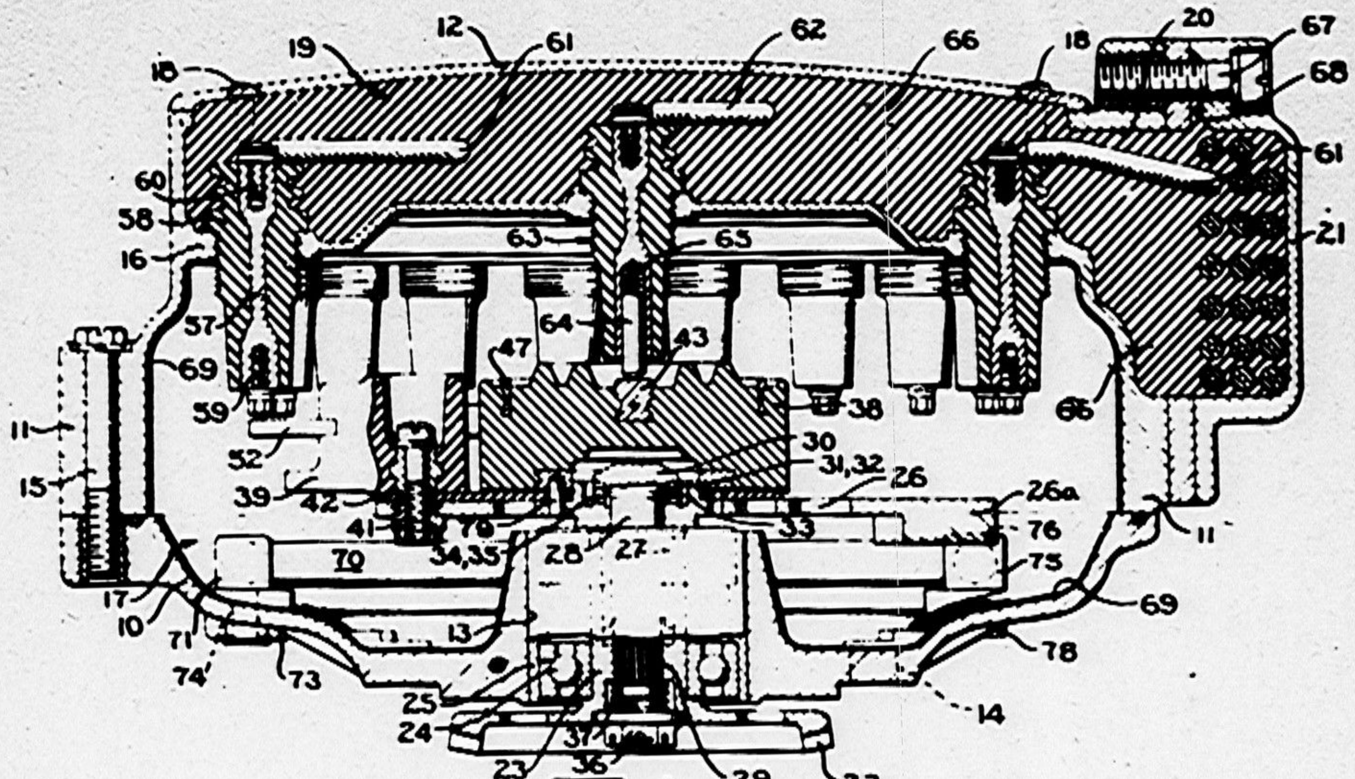


Fig 1

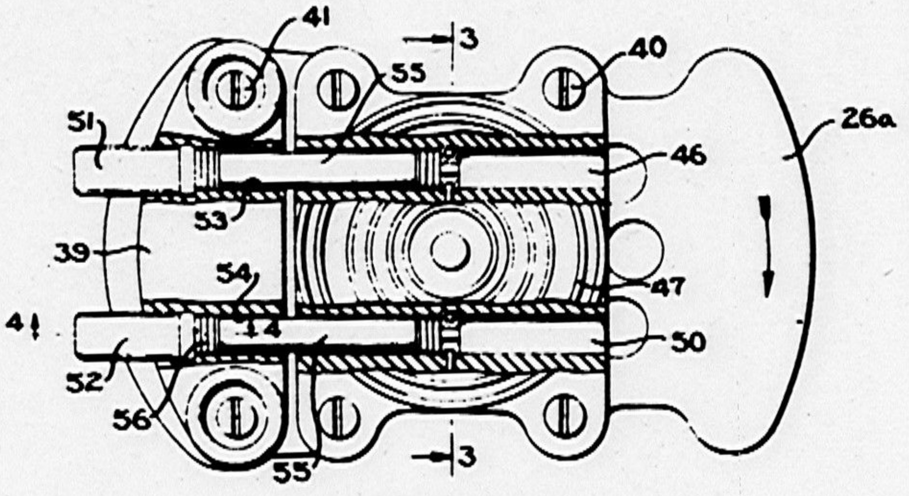
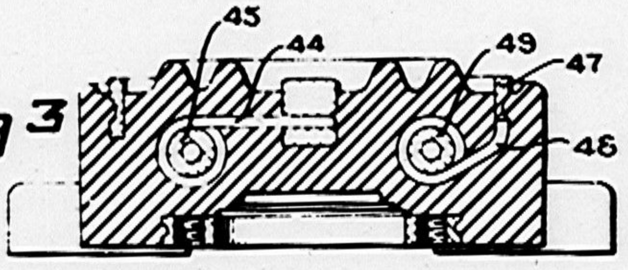


Fig 2

Fig 3



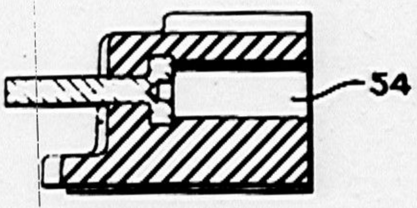


Fig 4

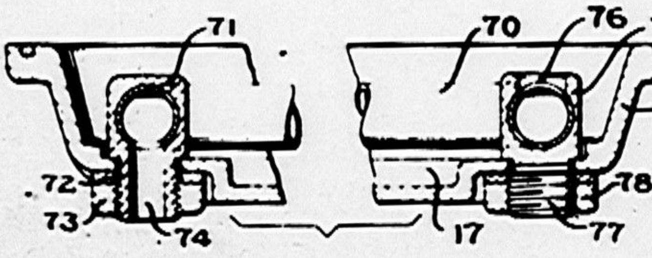


Fig 5

INVENTOR
Jakob R. Frei
BY F. Bascom Smith
ATTORNEY

67 Mailed Oct 8 1942

Division 37
Room 304

Paper No. 16
AW/1cm

DEPARTMENT OF COMMERCE

U. S. PATENT OFFICE
Richmond, Virginia

Before the Board of Appeals
On Appeal

In re application of Jakob R. Frei
Serial No. 360,227
Filed Oct. 8, 1940
For: Distributor

Examiner's Statement

This is in answer to appeal received in the United States Patent Office at Richmond, Virginia, August 13, 1942.

The appeal concerns the rejection of 3 claims—18, 19 and 20.

Claims allowed are 1, 2, 3, 4, 5, 10, 11 and 15.

The rejection is on the ground that the claims do not read on applicant's disclosure and are therefore not in compliance with Section 4888 R. S. They are also rejected on the ground of containing new matter.

No claims are rejected on references.

One of the rejected claims, 18, is copied from a patent to Scott 2,286,233, June 16, 1942, 123-148. A copy of the patent accompanies this statement.

In general applicant avers that the rejection is erroneous.

The Claims

18. In a distributing mechanism for high tension magnetos combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure and another chamber for housing a rotary dis-

tributing member, and a partition in said casing member adapted to prevent access of fluid from one of said chambers to the other, said partition including terminal mountings whereby the ends of cables housed in the one chamber may be brought into conducting relation with the rotary distributing member in the other chamber.

19. In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal
68 mountings whereby the ends of cables housed in the
first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

20. In a high tension ignition device, the combination comprising a casing member adapted to be divided into a chamber of housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

The Invention

The invention is in a distributor for internal combustion engines, in general consisting of a rotor 38-39 having a rotating distributing conductor such as 52, a casing member 10, 11 and 12, with a chamber 19 for housing supply and distributing cables in a suitable insulating substance 66 which is a solid and yet of a pliable nature. One substance which applicant has found suitable is polymerized cashew nut-shell oil. The chamber 19 and harness 21 filled with the insulating substance prevents moisture from entering or accumulating in said chamber and harness. There is a partition 16 in said casing member to separate one chamber from the other, said partition including terminal mountings 58-63 whereby the ends of cables housed in the one chamber may be brought into conducting relation with the rotary distributing member in the other chamber.

The Claims

Claim 18 copied from the Scott patent calls for the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure
and another chamber for housing a rotary distribut-
69 ing member, and a partition in said casing member
adapted to prevent access of fluid from one of said
chambers to the other, said partition including terminal mountings whereby the ends of cables housed in the one chamber may be brought into conducting relation with the rotary distributing member in the other chamber.

It is to be noted that the above discussed claim 18 calls for a casing member adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure and that the partition member is adapted to prevent the access of fluid from one of said chambers to the other.

Claim 19 does not include an atmosphere of fluid dielectric as in the above claim 18 but it does include the partition adapted to prevent the access of gases from the second chamber to the first.

Claim 20 includes only the partition in said casing member adapted to prevent access of gases from the second chamber to the first, together with all of the other elements of both of the claims 18 and 19.

The Rejection

The claims were finally rejected on the grounds of not reading on applicant's disclosure and therefore not in compliance with Section 4888 R. S. and also on the grounds of containing new matter.

Applicant's specification and claims as originally filed contain no suggestion that the supply and distributing cables are housed in an atmosphere of fluid dielectric under pressure. As shown and described, the cables are imbedded in a plastic material which is neither fluid or solid. 70 A plastic material is not an atmosphere of fluid dielectric as called for in 18. Applicant's partition is therefore not adapted to prevent access of fluid from one of said chambers to the other. There is no difference of pressure assumed in the invention and there is no suggestion that the invention was conceived under the impression that the bottom chamber was to hold a fluid or gas under pressure for a specific purpose. The bottom chamber is purposely vented to the atmosphere and would have the same pressure as that existing in the surrounding atmosphere. The upper chamber would also be subject to the same pressure.

Claim 19 states that there is a partition in said casing member adapted to prevent access of gases from the second chamber to the first. This partition is not adapted to prevent access of gases from the second chamber to the first. Applicant's use of the device does not imply or presuppose a difference in pressure between the two chambers. One chamber is vented to the atmosphere and the other chamber is filled with plastic. There is no pressure present other than atmospheric and the partition was not conceived with a difference in gas pressure in mind or more correctly stated, there is nothing in the specification or claims which would imply such a conception.

Claim 20 is of the same scope as claim 19 and does not require separate discussion.

Conclusion

The claims in order to be admissible must be readable on their supporting specification and therefore the specifica-

tion must contain supporting matter such as the matter contained in the Scott patent specification which states in
part that an object of the invention is to provide an
71 ignition system for a multi-cylindered engine which
is fired from a single source and to incorporate means
for circulating air under pressure through the source of current and ventilating same together with a ventilated harness that is also filled with air under pressure, and which further includes a unitary ignition system having means for supercharging in which all parts are balanced and matched.

There is nothing in applicant's specification which states or implies that his device incorporates the circulation of air under pressure and thereby increasing the dielectric strength and eliminating corrosive gaseous products from vital parts. There is further nothing in his specification which states or shows that a casing member is adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure and another chamber for housing a rotary distributing member and a partition adapted to prevent access of fluid from one of said chambers to the other. This would require that the distributor be equipped with ducts or leading in pipes such as shown at 19, 19′, 31 and 32 of the patentee's device.

In applicant's original showing there is nothing which would lead to the conclusion that it is adaptable as a device in which pressure may be applied to its chambers. It appears to be constructed as any timer distributor with an enclosure except that it was designed to prevent radio interference by constructing the case of metal. This is emphasized in the statement in applicant's specification that an
object of the invention is to provide a novel distribu-
72 tor which is so constructed that the same is inher-
ently radio-shielded without the addition of special
shielding parts.

Applicant's bottom chamber is vented to the atmosphere as at 74. The providing of such a vent renders the device inadaptable for housing a rotary distributing member for receiving a fluid under pressure as is called for in the rejected claims. This is an additional reason why the claims are not supported by the specification.

The rejection on the grounds of new matter is based on the fact that the original specification and claims did not contain any basis for a casing member adapted to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure and a partition in said casing member adapted to prevent access of fluid from one of said chambers to the other.

M. E. WEAVER
Examiner

N. D. PARKER, JR.
501 McLachlen Building
Washington, D. C.

* * * * * * * * * *

Decision of the Board of Appeals

100 Endorsed: U. S. Patent Office Board of Appeals Jan 26 1943 Mailed

Appeal No. 44,790
Hearing: January 11, 1943

IN THE UNITED STATES PATENT OFFICE

Before the Board of Appeals

Ex parte Jakob R. Frei

Application for patent filed October 8, 1940, Serial No. 360,227. Distributor.

Mr. F. Bascom Smith and Mr. N. D. Parker, Jr., for applicant.

This is an appeal from the decision of the examiner finally rejecting claims 18, 19 and 20.

The following claim is illustrative:

18. In a distributing mechanism for high tension magnetos the combination comprising a casing member adapted

to be divided into a chamber for housing supply and distributing cables in an atmosphere of fluid dielectric under pressure and another chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of fluid from one of said chambers to the other, said partition including terminal mountings whereby the ends of cables housed in the one chamber may be brought into conducting relation with the rotary distributing member in the other chamber.

Appellant has copied claims from the Scott patents for the purpose of interference, and the examiner has held that the claims do not read, and in fact introduce new matter. Appellant discloses a casing for the distributing mechanism of a high tension magneto with a solid partition ex-
101 tending between the side walls thereof and supply
and distributing cables housed on one side of the partition and a rotary distributing member on the opposite side. Appellant in his specification describes chamber 19 as preferably filled with a suitable insulating substance 66 and this is preferably of a solid and yet is of a pliable nature. Because of the use of the word "preferably" appellant urges that this material may be omitted. However, this language might be applied to a filling different from the polymerized cashew nut-shell oil referred to in the specification. Obviously, if this chamber is so filled there would be no chance for a fluid dielectric under pressure to pass into this chamber. However, even if this language were construed as covering an empty chamber 66, we still think that the claims copied from the Scott patents should not form the issues of an interference.

Appellant concedes that the adaptation clauses in these claims would not read and there is no teaching in the application of providing a partition in the casing to prevent access of fluid from one chamber to the other. On the other hand, in the Scott patents there is a teaching in this regard. For instance, in patent No. 2,286,232 on page 2, there is a statement as to the adjacent chambers being made

substantially gas tight and a similar statement is found on page 2, of patent No. 2,286,233. While this latter patent is the only one which describes passage of air under pressure from one compartment to the other, yet the claim copied from patent No. 2,286,232 has an adaptation clause referring to the prevention of access of gases from one chamber to the other. Whether appellant's plugs 63
102 are gas tight or not is unknown.

Appellant urges that inasmuch as in certain infringement cases the adaptation clauses in the counts have been ignored in considering the questions of infringement that the same test should be made in connection with counts copied from a patent for the purpose of interference. We are not of this view and find support for our opinion in several decisions of the Court of Customs and Patent Appeals—McKee vs. Noonan, 86 Fed. (2d) 986. On page 989 is this statement,

> "It has frequently been pointed out that in the interference practice in the Patent Office, for reasons which are obvious, the tribunals do not always, in their interpretation of counts, employ the same rules as do the courts in equity, where the infringement of claims is involved. Nevertheless, if the so-called functional limitations being considered by the courts in the above-cited cases were material and essential and should not be ignored, we see no reason why, under the peculiar and rather exceptional statement of facts at bar, the limitation now under consideration should have been ignored by the Board of Appeals in arriving at its conclusion. See MacFarren v. Morgan, 24 Fed. 58 App. D. C. 77 (2d) 1003".

Also In re Buttolph 73 Fed. (2d) 936 in a similar situation an introductory clause in the counts was not ignored. We note this statement—

> "Whether the phrase 'for positive column light' may be relied upon to lend patentability to the claims of the Hertz patent is not a matter for our consideration here. It is a

limitation in the claim, is obviously relied upon for novelty, and we think that the Patent Office tribunals were correct in holding that appellant could make the claims involved only by showing that he disclosed this limitation in his application, and were correct in rejecting such claims when presented in appellant's application''.

103 It is our opinion that the situation here is similar to those considered by the court in the two cases above discussed and therefore that appellant is not entitled to and there is no proper support for the claims copied from the patent.

The decision of the examiner is affirmed.

J. W. CLIFT
Examiner-in-Chief

C. H. SHAFFER
Examiner-in-Chief

E. F. KLINGE
Examiner-in-Chief
Board of Appeals

MR. N. D. PARKER, JR.,
501 McLachlen Building,
Washington, D. C.

Jan. 26, 1943.

* * * * * * * * * *

105 Filed Feb 18 1943

IN THE UNITED STATES PATENT OFFICE

Before the Board of Appeals

Appeal No. 44,790

In re Application of Jakob R. Frei
Serial No. 360,227
Filed October 8, 1940
For: Distributor

Request for Reconsideration

Now comes Jakob R. Frei, by his attorney, and requests that the Honorable Board of Appeals reconsider their decision of January 26, 1943, in the matter of the above-identified appeal with respect to claims 18, 19 and 20. Reconsideration is requested for the reason that it appears from the decision of the Hon. Board of Appeals that appellant's position has been misinterpreted in several respects and for the further reason that the first sentence in the first paragraph, beginning on page 2 of the decision, is not clear to appellant.

Appellant did not intend to be understood as saying that the adaptation clauses of the appealed claims should be ignored, as indicated in the first complete paragraph beginning on page 3 of the decision. Such clauses should not be ignored—they do impart limitations as to the capabilities of the structure positively set forth. In none of the cases cited by appellant was an adaptation clause ignored—such clauses were merely given their only plausible interpretation, i.e., that such clauses are "merely descriptive". The cases cited held that such clauses are satisfied by a structure which is capable of functioning in the manner specified in the clause. It is respectfully submitted that this is the only fair and reasonable interpretation for such clauses, regardless or whether the immediate question is one of interference, infringement or anything else.

106 It is not appellant's contention, therefore, that the adaptation clauses of the appealed claims be ignored. Appellant does contend, however, that his disclosure supports the adaptation clauses of the claims.

In the decision of the Hon. Board of Appeals, it is conceded (pages 1 and 2) that appellant discloses a casing for the distributing mechanism of a high tension magneto "with a solid partition extending between the side walls thereof." This "solid partition", which is for all practical purposes identical with the corresponding partition of the Scott patents, is inherently capable of preventing the passage of a fluid or gas from one of the chambers 17 or 19 to the other. This "solid partition" is, therefore, "adapted to prevent access of fluid (or gases) from one of said chambers to the other" and this is all that any of the claims require with respect to the partition.

.On page 2 of their decision, the Hon. Board of Appeals states that:

> "Appellant concedes that the adaptation clauses in these claims would not read and there is no teaching in the application of providing a partition in the casing to prevent access of fluid from one chamber to the other."

This statement is not clear to appellant's attorney—the first part does not appear to be properly joined with the last part by the conjunction "and". In any event, appellant's attorney has no recollection of having made a concession that "the adaptation clauses in these claims would not read". It is appellant's contention that the capabilities required by the adaptation clauses of the appealed claims are inherent in the structure disclosed by appellant. It is appellant's contention that since the partition provided by appellant is necessarily capable of preventing "access of fluid (or gases) from one chamber to the other", the claims are supported by his disclosure. Where
107 the required capabilities are inherent in the structure fully disclosed, it is well settled that the absence of statements to this effect in the specification, such

as found in the Scott patents, is not material. It is, in fact, immaterial whether appellant even knew of the required capabilities or qualities at the time he filed his application. (Swan v. Thompson, 80 Fed. (2d) 374). That which is inherent in a structure need not be specifically mentioned. "An inventor may disclose his invention by drawings, by the use of language, or he may disclose it by reciting and teaching such subject matter as will inherently do the thing or possess the quality which is claimed for it." (Hansgirg v. Kemmer, 26 CCPA——; 40 USPQ 665 and other cases cited therein; In re Ruttenauer, 22 CCPA 735; 73 Fed. (2d) 492). The adaptation clauses in question require only that the partition "possess a quality" which is inherently possessed by appellant's partition, i.e., the quality of being able to prevent the passage of fluids or gas.

It is noted that Your Honors held that, "Whether appellant's plugs 63 are gas tight or not is unknown." This question was not discussed in appellant's brief or at the hearing because the Primary Examiner did not at any time question the fluid or gas tightness of appellant's partition which includes plugs 63. Appellant has assumed, therefore, that the Examiner conceded the fluid tightness of his partition. The fundamental basis of the Examiner's rejection was that appellant did not make provisions for or mention the use of a fluid dielectric under pressure and accordingly the arguments heretofore presented by appellant have been directed to the impropriety of the reasoning advanced by the Examiner. It is now respectfully submitted that the above holding by Your Honors is not reasonably supported by the facts and that the Examiner was correct in not questioning the fluid or gas tightness of appellant's partition. It is obvious that the metal
108 conductors 57 of appellant's terminal plugs are solid
and gas-tight. It is also obvious that the molded insulating material 58 of these terminal plugs is solid and gas-tight. It is stated in appellant's specification that conductors 57 are embedded in the molded insulation 58 and it is also obvious from the drawings that there is intimate

contact between the insulation 58 and the outer walls of conductors 57. What more could be necessary to make it clear that these terminal plugs are capable of preventing and do in fact prevent the passage of fluid or gas, as required by the claims. It is believed to be abundantly clear from appellant's drawings and description that the terminal plugs inherently possess the capabilities required by the adaptation clauses of the appealed claims. A different conclusion would not give appellant the benefit of the inherent capabilities of his structure as illustrated and described, a benefit to which he is unquestionably entitled. Additionally, it should be noted that these terminals are, in substance, like those of the Scott patents which are also gas-tight.

Although it is believed to be immaterial with respect to the conclusions reached by the Hon. Board of Appeals, it is respectfully submitted that the following statement contained in the decision constitutes error:

> "Obviously, if this chamber is so filled there would be no chance for a fluid dielectric under pressure to pass into this chamber."

The cashew-nut-shell oil compound referred to in appellant's specification is a somewhat porous material and will accordingly accommodate or absorb some gases. Accordingly, it would be possible for some gases to flow from appellant's chamber 17 into chamber 19, if the partition did not prevent such access.

109 In view of the foregoing, it is respectfully submitted that Your Honors' decision of January 26, 1943, should be vacated and the decision of the Primary Examiner reversed.

Respectfully submitted,
F. BASCOM SMITH
Attorney for Frei

New York, New York,
February 17, 1943.

* * * * * * * * * *

110 Filed Mar 1 1943

Appeal No. 44,790 Paper No. 23

IN THE UNITED STATES PATENT OFFICE

Before the Board of Appeals

Ex parte Jakob R. Frei

Application for Patent filed October 8, 1940, Serial No. 360,227. Distributor.

Mr. F. Bascom Smith and Mr. N. D. Parker, Jr. for appellant.

On Request for Reconsideration

Appellant requests reconsideration of our decision of January 26, 1943.

Appellant concedes that the adaptation clauses of the appealed claims should not be ignored but impart limitations to the structure positively set forth. He then urges that his disclosure is such that inherently his partition in the casing of the high tension magneto would prevent the passage of fluid or gas from one of the chambers 17 or 19 to the other. We pointed out in our decision that that did not necessarily follow and are not convinced to the contrary.

Appellant points to a sentence on page 2 of the decision which may not appear clear to appellant, but we consider it means that not only the adaptation clauses 111 in the claims would not read but there is no teaching in the application of providing a partition to prevent access of fluid from one chamber to the other.

We have noted appellant's statements in his original brief, on page 24, that it is

> "immaterial in the present case whether or not applicant has mentioned the use of an atmosphere of fluid dielectric under pressure or the mere fact that applicant's partition is capable of preventing the passage of fluid or gases from one chamber to the other."

He then urges that what would anticipate if earlier would render invalid the claims of the Scott patents, and hence must be held to support the same in the present instance.

In other words, he is urging in accordance with the decisions involving infringement that an interference should be set up in any case where infringement might lie or at least that seems to be the argument as we understand it and therefore we pointed out that was not the fact and referred to certain decisions to support our position.

It is also urged that the examiner conceded the fluid tightness of appellant's partition whereas we do not. Whether that is a fact or not is unimportant. We pointed out in certain statements why we thought that appellant is not entitled to make the claims of the patent. While our statement that the chamber is filled and there would be no chance for fluid dielectric under pressure to pass into this chamber, may not be strictly accurate when some porous material is used, yet the chamber could not be gas filled.

We fail to find any satisfactory reasons why we
112 should reverse our position.

Appellant's petition for reconsideration is granted but our decision stands.

J. W. CLIFT
Examiner-in-Chief

C. H. SHAFFER
Examiner-in-Chief

E. F. KLINGE
Examiner-in-Chief
Board of Appeals

March 1, 1943

MR. N. D. PARKER, JR.
501 McLachlen Building
Washington, D. C.

* * * * * * * * * *

Plaintiff's Exhibit No. 9.

140 Filed May 24 1944

R-2800 HARNESS PLUG CONTACT

AIR LEAKAGE TEST

		Large Air Container	
Date	Time	Pounds	Temp.
2-23-44	8:00 A.M.	13.8	75°F
2-24-44	8:00 A.M.	13.7	73°F
2-25-44	8:00 A.M.	13.25	68°F
2-26-44	8:00 A.M.	13.25	70°F
2-28-44	8:00 A.M.	13.6	72.5°F
2-29-44	8:00 A.M.	13.6	72°F
3- 1-44	8:00 A.M.	13.4	68°F
3- 2-44	8:00 A.M.	13.25	71°F
3- 3-44	8:00 A.M.	13.25	72°F
3- 4-44	8:00 A.M.	13.5	74°F
3- 6-44	2:30 P.M.	13.5	74°F
3- 7-44	8:00 A.M.	13.75	77°F
3- 8-44	8:00 A.M.	13.5	72°F
3- 9-44	8:00 A.M.	13.6	77°F
3-10-44	8:00 A.M.	13.4	70°F
3-11-44	8:00 A.M.	13.2	71°F
3-13-44	8:00 A.M.	13.8	78°F
3-14-44	8:00 A.M.	13.25	71°F
3-15-44	8:00 A.M.	13.25	72°F
3-16-44	8:00 A.M.	13.25	73°F
3-17-44	8:00 A.M.	13.75	76°F
3-20-44	8:00 A.M.	13.5	72°F
3-21-44	8:00 A.M.	13.25	72°F

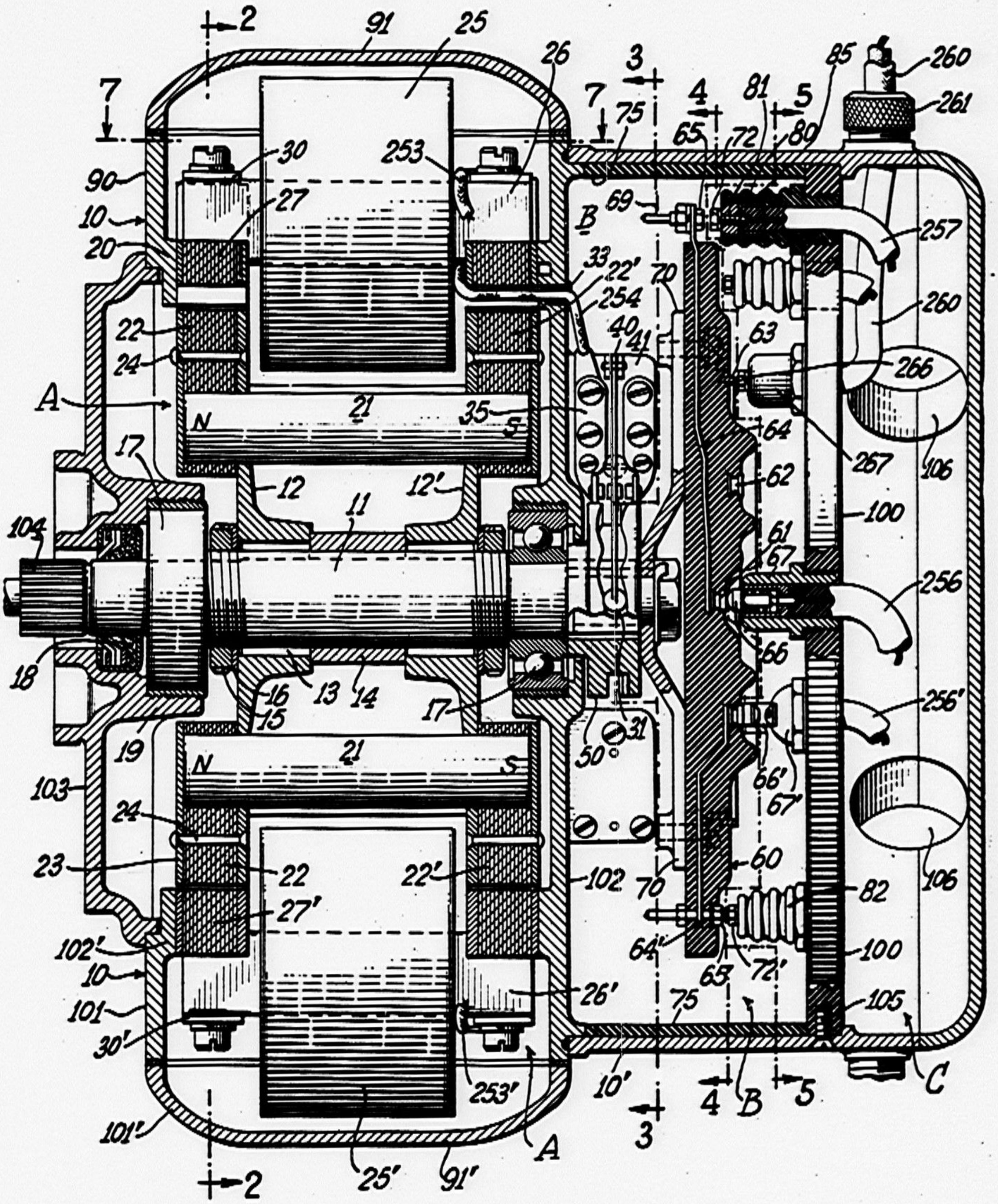
* * * * * * * * * *

June 16, 1942. L. H. SCOTT **2,286,232**

MAGNETO-ELECTRIC MACHINE

Filed Jan. 14, 1941 8 Sheets-Sheet 1

Fig.1.



INVENTOR

BY Lloyd H. Scott

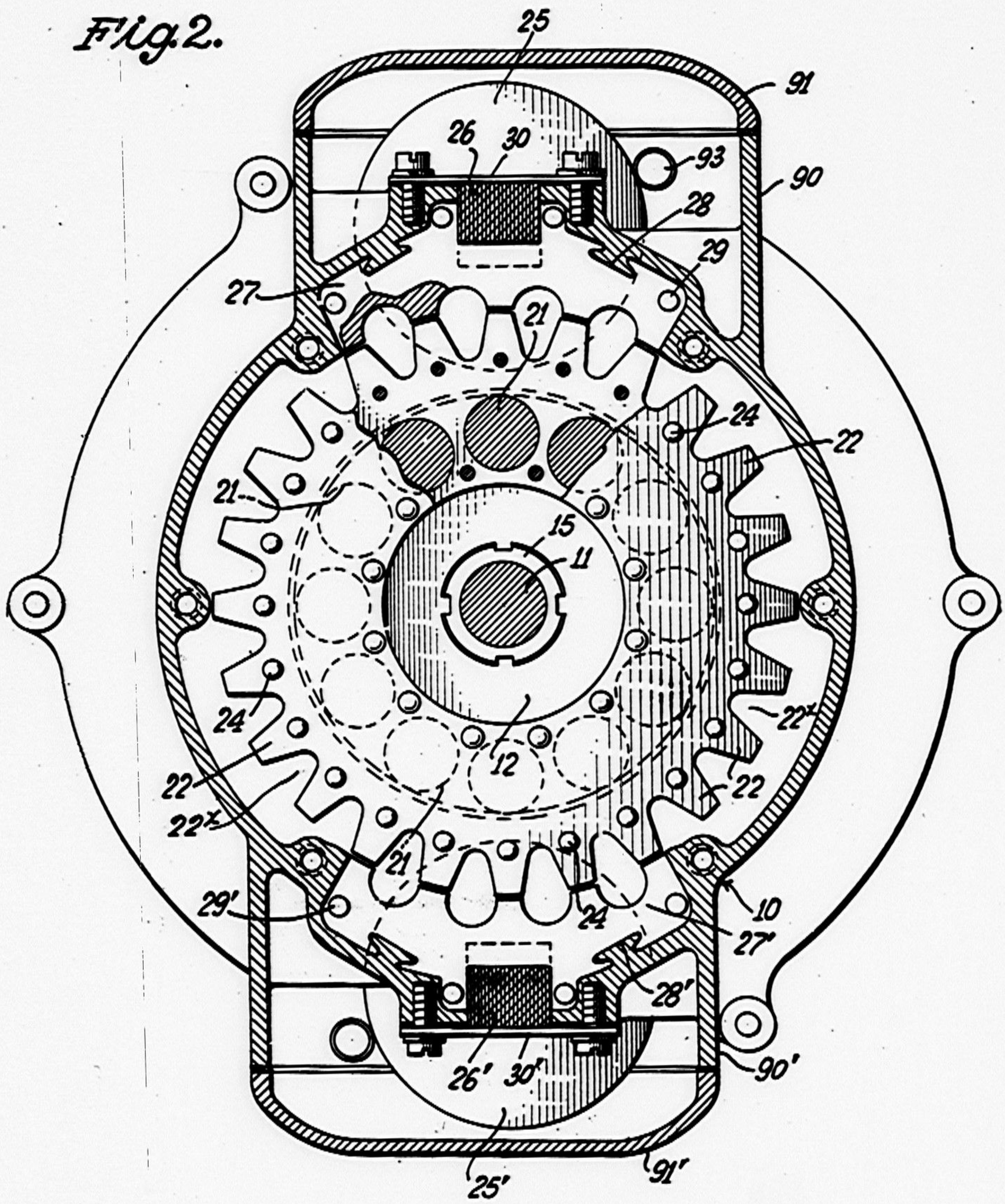
Watson, Bristol, Johnson & Leavenworth
ATTORNEYS

June 16, 1942. L. H. SCOTT **2,286,232**

MAGNETO-ELECTRIC MACHINE

Filed Jan. 14, 1941 8 Sheets-Sheet 2

Fig. 2.



INVENTOR

BY Lloyd H. Scott

Watson, Bristol, Johnson & Leavenworth

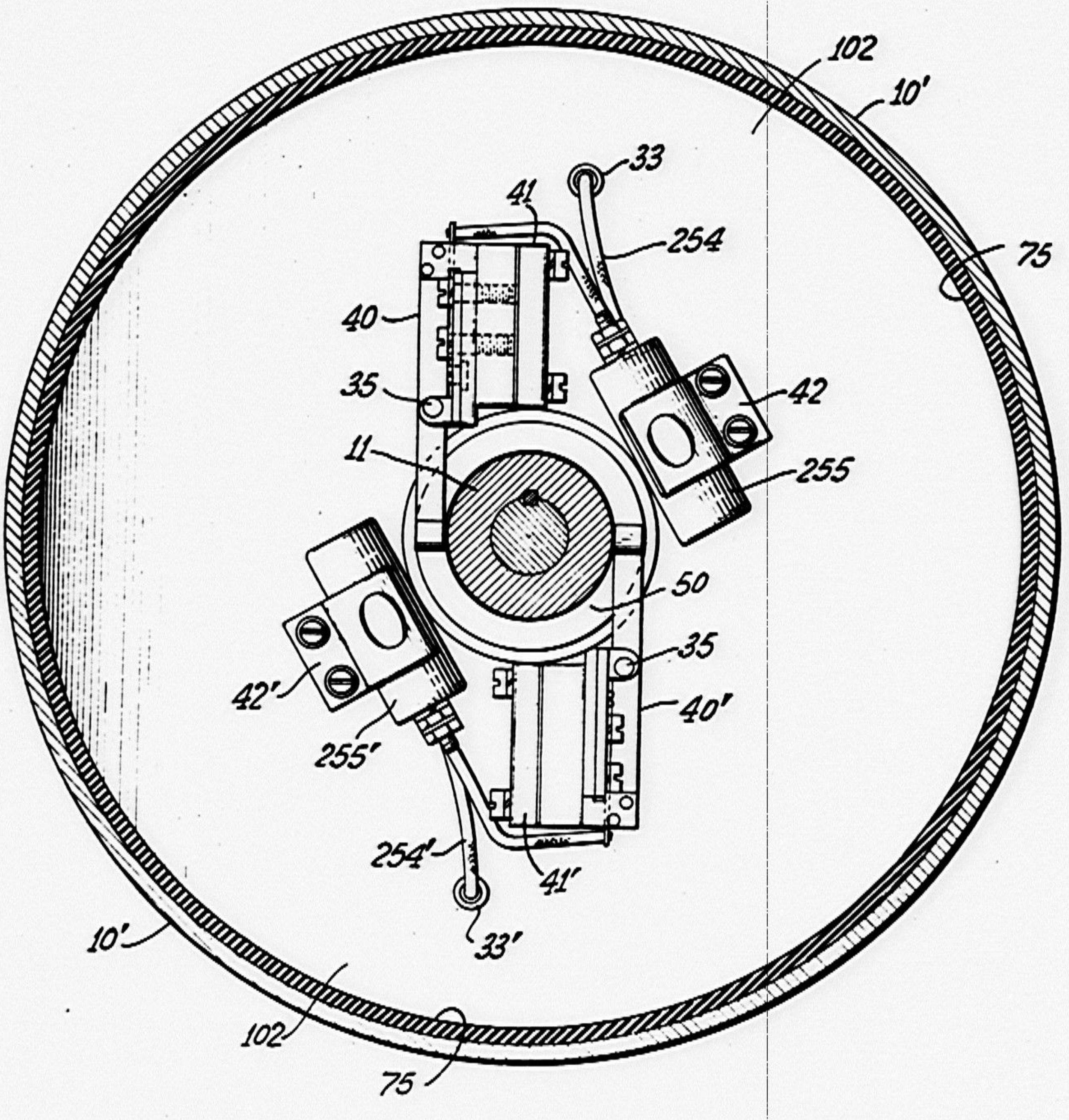
ATTORNEYS

June 16, 1942. L. H. SCOTT **2,286,232**

MAGNETO-ELECTRIC MACHINE

Filed Jan. 14, 1941 8 Sheets-Sheet 3

Fig. 3.



INVENTOR

BY Lloyd H. Scott

Watson, Bristol, Johnson & Leavenworth

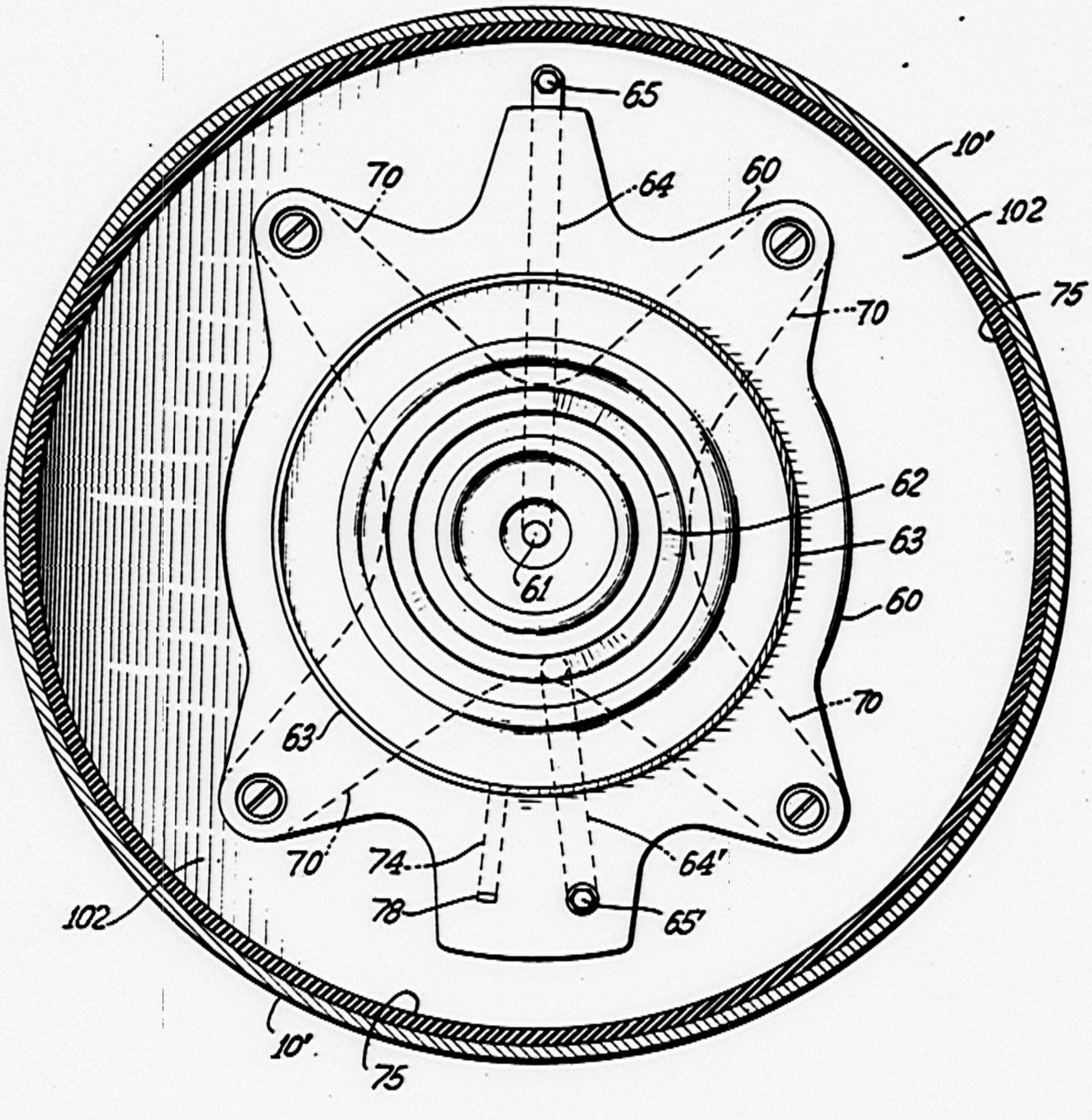
ATTORNEYS

June 16, 1942. L. H. SCOTT 2,286,232

MAGNETO-ELECTRIC MACHINE

Filed Jan. 14, 1941 8 Sheets-Sheet 4

Fig. 4.



INVENTOR

BY Lloyd H Scott

Watson, Bristol, Johnson & Leavenworth

ATTORNEYS

June 16, 1942. L. H. SCOTT **2,286,232**

MAGNETO-ELECTRIC MACHINE

Filed Jan. 14, 1941 8 Sheets-Sheet 5

Fig. 6.

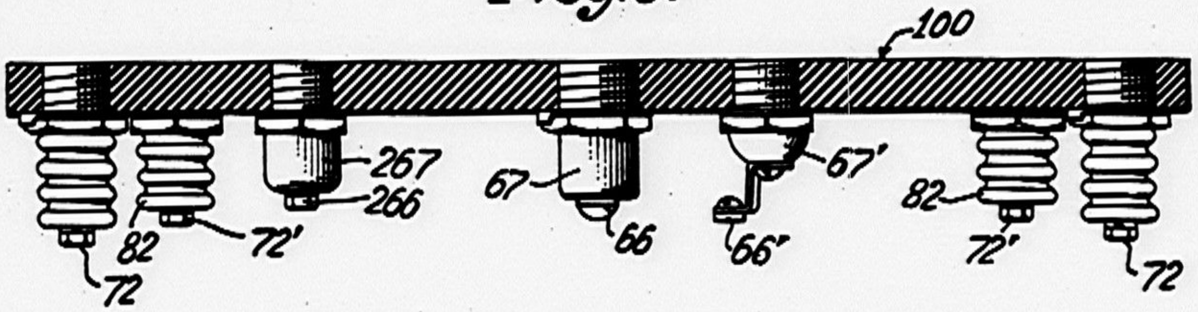
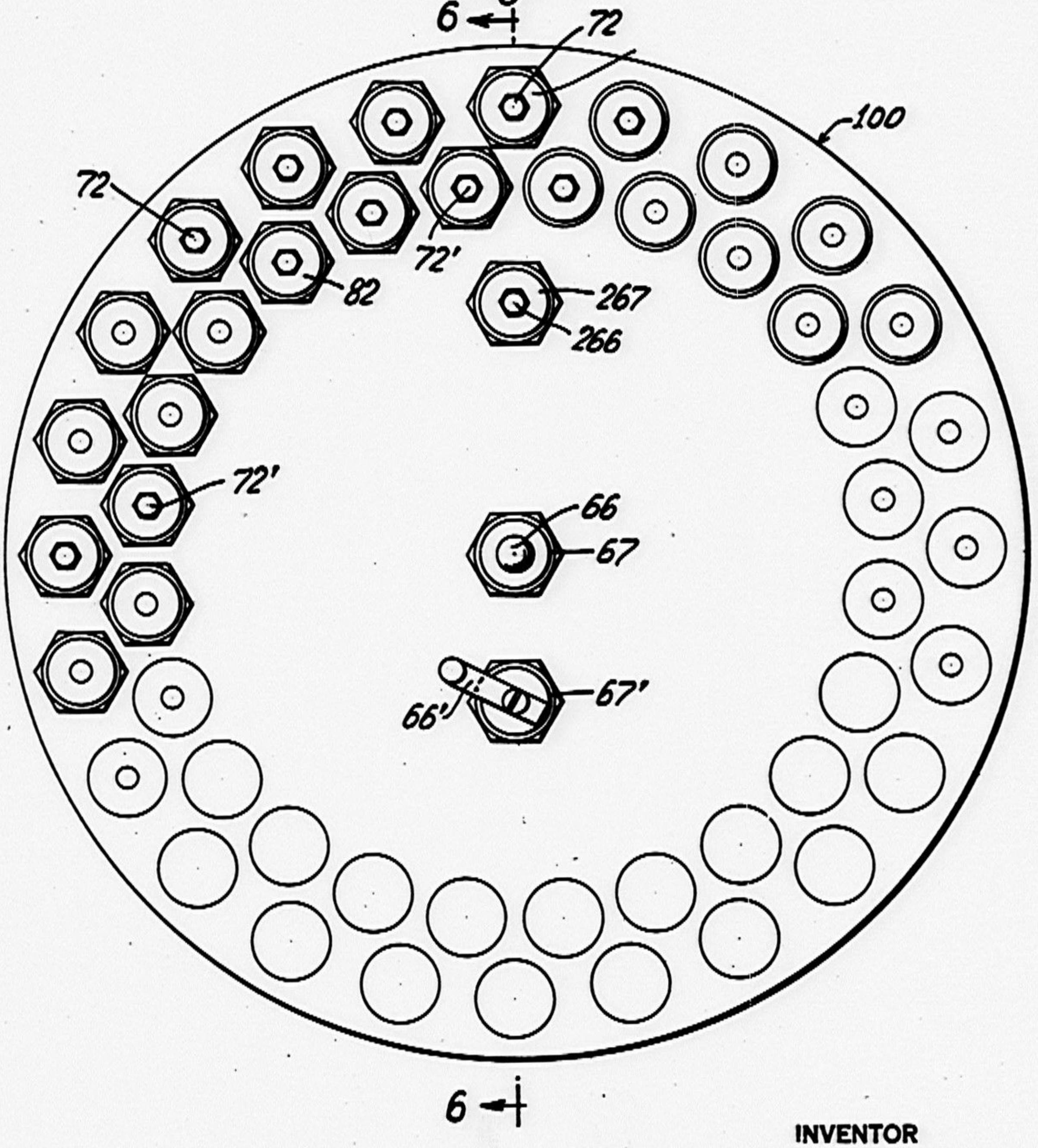


Fig. 5.



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ATTORNEYS

June 16, 1942. L. H. SCOTT 2,286,232

MAGNETO-ELECTRIC MACHINE

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Fig. 7.

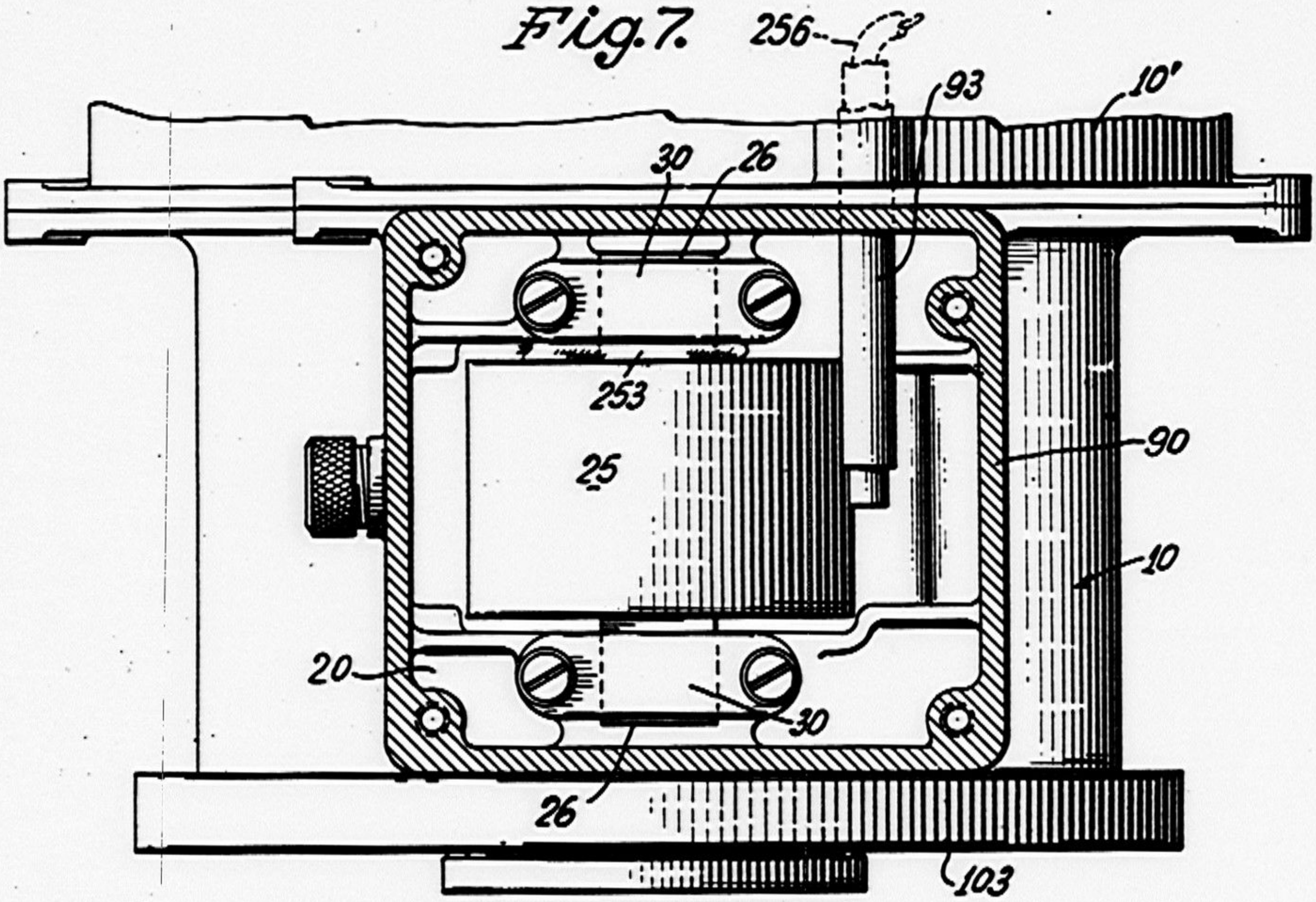
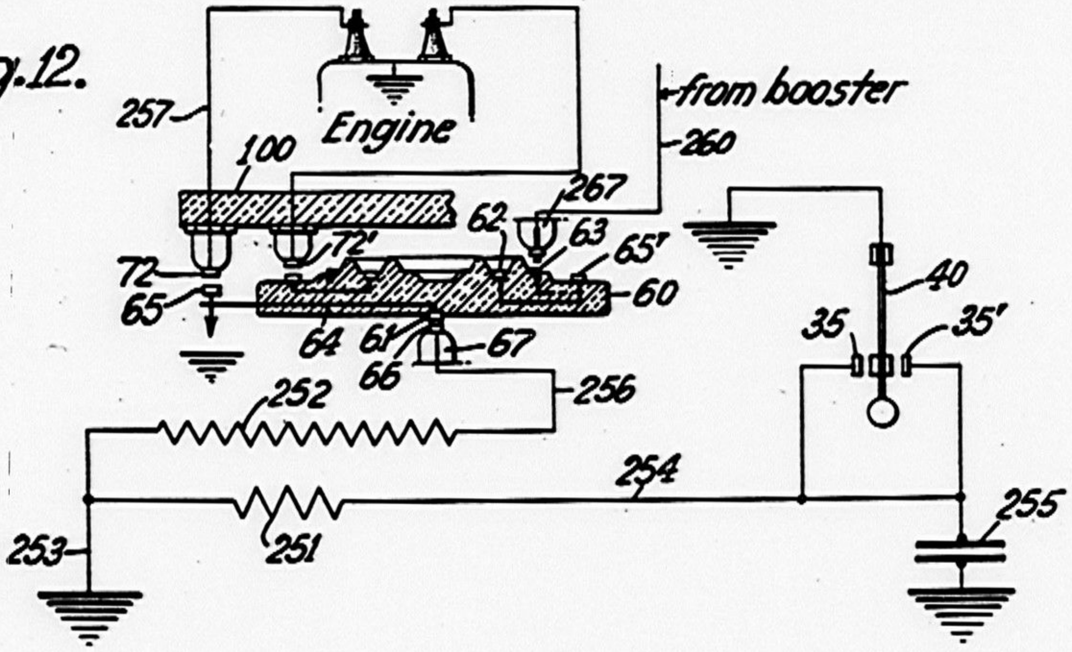


Fig. 12.



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MAGNETO-ELECTRIC MACHINE

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Fig. 8.

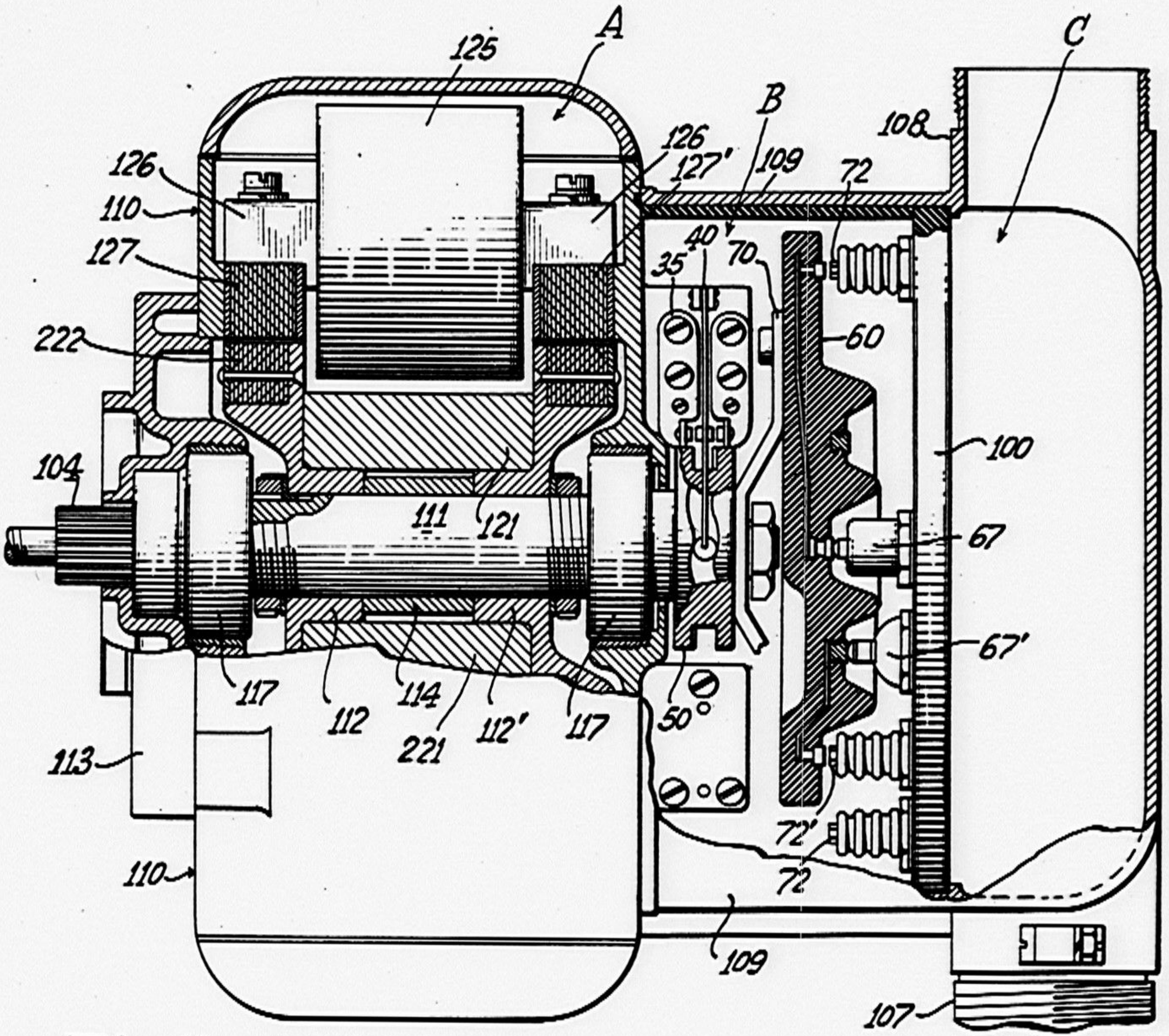

Fig. 13.

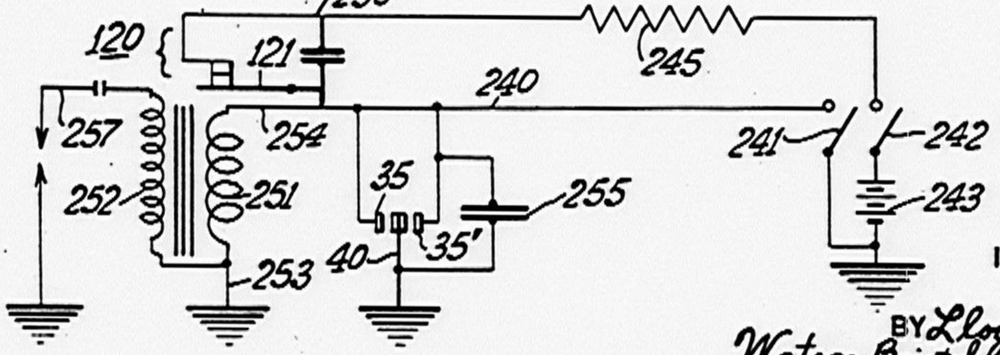

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Fig. 9.

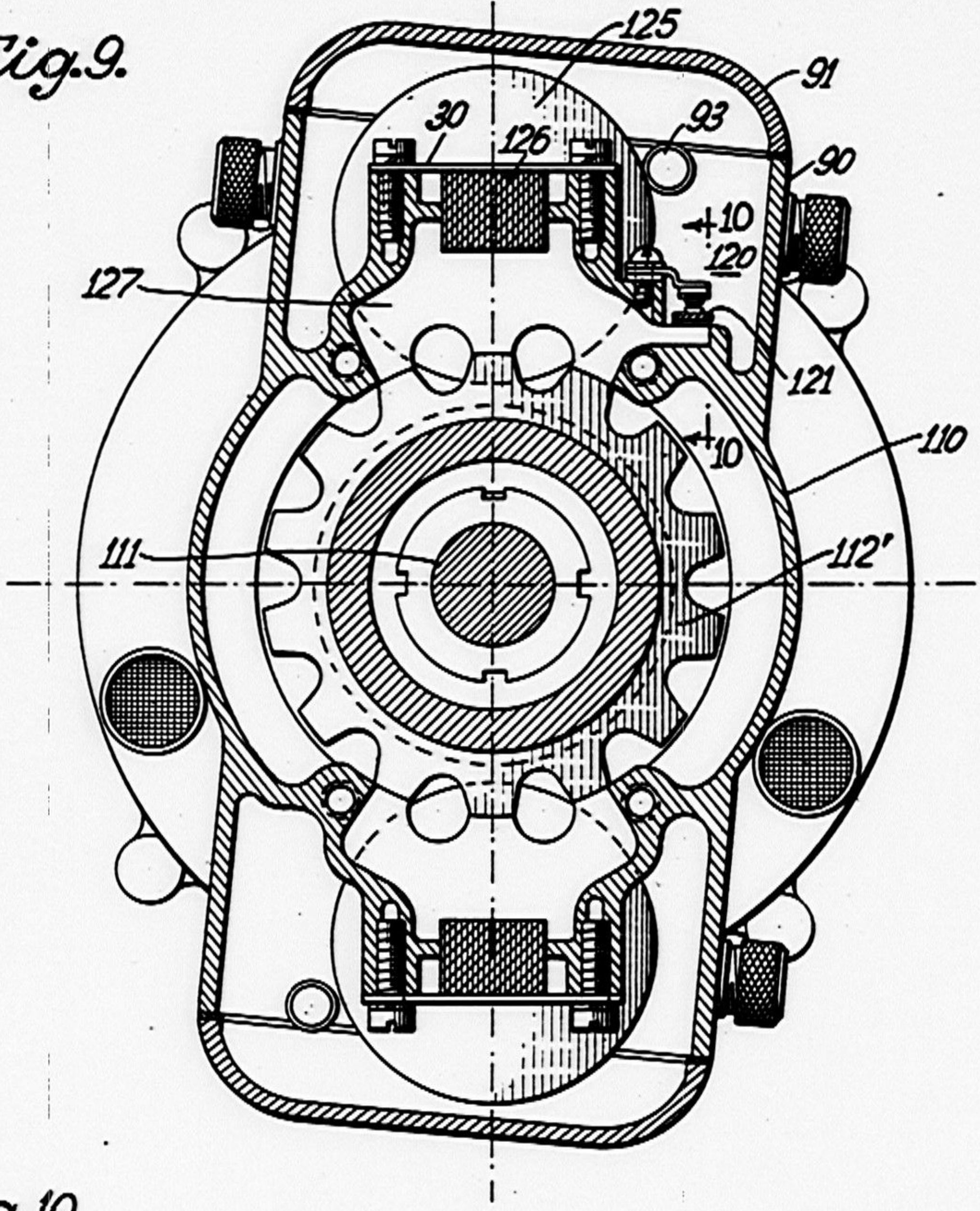


Fig. 10.

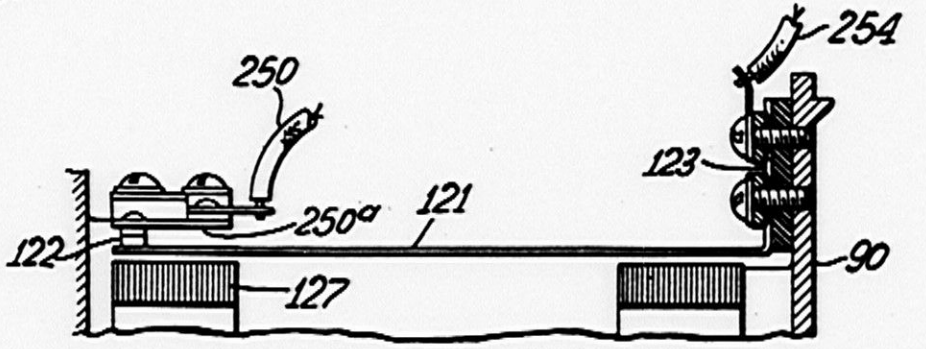
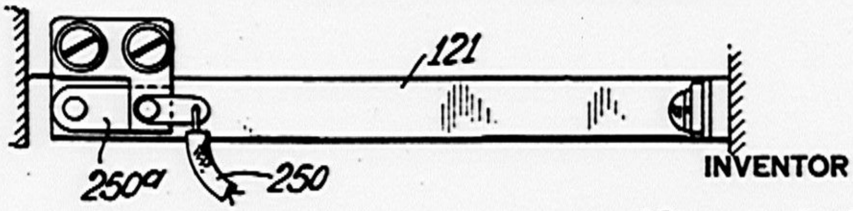


Fig. 11.



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Patented June 16, 1942

2,286,232

UNITED STATES PATENT OFFICE

2,286,232

MAGNETOELECTRIC MACHINE

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Application January 14, 1941, Serial No. 374,324

18 Claims. (Cl. 171—209)

This invention relates to magneto-electric machines, and particularly to the general construction and assembly of magneto-electric machines.

The invention has for its object generally the provision of an improved construction and arrangement of parts in magneto-electric machines by which it is made light in weight and rugged in structure; all moving parts being rigidly assembled as a single rotating unit, whereby proper synchronization of the moving parts is assured in the assembly.

More specifically, the object of the invention is to provide a magneto-electric machine of the character indicated which is safe and reliable in operation at substantially any engine speed and is adapted to provide sparks in proper phase for any number of cylinders in an internal combustion engine.

Another object is to provide a magneto adapted to supply dual ignition in a multi-cylinder engine in a positive manner and in which the sparks are regenerated, thereby avoiding degradation.

Another object is to provide a magneto of the character indicated adapted for use with multi-cylinder engines, for example, with an airplane engine, and is constructed and arranged to be applied as a unit to the engine and adapted to be run at a relatively low speed such as one-half the engine speed.

Another object is to provide a construction which is adapted to incorporate in a single unit of relatively small size two or more magneto machines, for example, two magnetos which supply the sets of sparks for a dual ignition system.

Another object is to provide a magneto for multi-cylinder internal combustion engines with a distributor and spark gap arranged in a manner so as to be relatively unaffected by atmospheric conditions, such as humidity and pressure.

Another object is to provide a magneto with a casing or housing that has separate chambers which segregate the variously functioning elements; for example, a chamber for the windings, a second for the breaker and/or distributor, and a third for the distributing cable.

Another object is to provide a magneto with a casing or housing having segregating chambers for various operating parts, the chambers, or at least one of them, being made substantially gas-tight.

Another object is to provide a magneto with improved safety means for the high tension windings which employs a rotating spark gap, whereby, when arc-over occurs, no arc can be maintained.

Another object is to provide a magneto with improved means for attaching and detaching distributing cables, which is not only protected from dampness, corrosion, and the like, but also is convenient of access, whereby the cables may be quickly attached and/or detached.

Another object is to provide a magneto with a distributor having an improved arrangement for the electrodes or terminals of cables of a dual ignition system, whereby the same occupies relatively little space while maintaining a desired factor of safety.

Another object is to provide a magneto of the inductor type with an improved arrangement of magnetizing means whereby a single magnet may be substituted for a plurality of independent permanent magnets.

Still another object is to provide a magneto with an arrangement of windings which also incorporates a booster for starting purposes.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a vertical sectional view showing a magneto-electric machine constructed and adapted to supply high tension ignition current for a multi-cylinder internal combustion engine in accordance with the invention;

Fig. 2 is a transverse sectional view taken in the plane of the line 2—2 of Fig. 1, and looking in the direction of the arrows;

Fig. 3 is another sectional view, taken in the plane of broken line 3—3 on Fig. 1, and looking in the direction of the arrows;

Fig. 4 is a similar view, taken in the plane of broken line 4—4 of Fig. 1, and looking in the direction of the arrows;

Fig. 5 is a similar view, taken in the plane of broken line 5—5 of Fig. 1, and looking in the direction of the arrows;

Fig. 6 is a sectional view taken in the plane of the line 6—6 of Fig. 5;

Fig. 7 is a sectional view taken in the plane of the line 7—7 of Fig. 1, and looking in the direction of the arrows;

Fig. 8 is a view, partly in section and partly in elevation, showing a modified form of magneto-electric machine constructed in accordance with the invention;

Fig. 9 is a transverse section of the modification shown in Fig. 8, and discloses additionally the vibrator of a booster which may be incorporated in the magneto-electric machine in accordance with the invention;

Fig. 10 is a fragmentary sectional view, taken on the line 10—10 of Fig. 9;

Fig. 11 is a plan view of the vibrating element shown in Figs. 9 and 10;

Fig. 12 is a circuit diagram for the electrical system used with the modification shown in Fig. 1; and

Fig. 13 is a similar diagram for the electrical system used with the modification shown in Fig. 8.

A construction for a magneto adapted to furnish electrical energy for the ignition system of internal combustion engines of the multi-cylinder type is disclosed in the U. S. patent to Spohn, No. 2,015,091, issued September 24, 1935, in which a plurality of localized fields of induction are provided, each in a magnetic circuit, the number of which corresponds to the number of cylinders in the engine to be fired. In the Spohn magneto, the rotor carries the magnetizing means for the magnetic circuits, the windings in which current is induced being stationary and an independent set of windings being provided for each of the sets of sparks to be produced in a cylinder of an internal combustion motor or engine to be fired.

An improved construction for magnetos of the Spohn type is provided by the present invention, the arrangement comprising a casing having completely separate chambers for the windings with inducing elements, for the breaker and distributor mechanisms, and for the distributing cables, here employed. Such chambers may be, and for certain purposes are, made substantially gas-tight.

By the present invention, dual ignition may be conveniently provided for a multi-cylinder engine of substantially any number of cylinders, for example, a 24-cylinder unit. The arrangement permits of positively inducing the spark in each cylinder at the proper instant, even at relatively high speeds, for example, 72,000 sparks per minute may be had for a 24-cylinder engine, with a crank shaft speed of 3000 R. P. M. For such an engine, it is seen that the rotor need have but twenty-four localized fields of induction or poles to supply the desired ignition for a 24-cylinder engine. In such arrangement, the magneto rotor is driven at half engine speed, for example, 1500 R. P. M. for an engine crank shaft speed of 3000 R. P. M.

The segregation of the distributor in a separate chamber of the magneto permits the use of simply made parts which provide the desired insulating strength with the use of fabricated parts. A fabricated distributor head made of a single disk of insulating material permits the use of separately made insulating bushings for the terminals of the distributing cables. Where dual ignition is employed for a 24-cylinder engine, it is seen that forty-eight insulating bushings are required to be mounted on the distributor head for the single magneto to be employed in accordance with the invention. To have these terminal bushings arranged in a relatively small space, these may be arranged in two concentric circles in which the proper spacing is obtained as well as the desired sequence in the firing of the engine cylinders.

Referring now to the drawings, and particularly to Figs. 1 and 2, 10 denotes generally a main casing which is arranged to house the magneto structure, the casing having an auxiliary portion 10′ mounted thereon. Walls 101 and 102, together with an insulating member or disk 100 disposed in portion 10′ (for purposes hereinafter more fully described), divide the casing into three chambers, namely, those denoted A, B, and C, respectively. The chamber A, between walls 101 and 102, serves to house the rotor and windings of the magneto, while chamber B, between wall 102 and partition or disk 100, serves to house breaker and distributor mechanisms, hereinafter described. Chamber B may be open to the atmosphere, but, if in a magneto for an engine intended for high altitude aviation, is substantially gas-tight. The disk 100, which separates chambers B and C, is fitted tightly into casing portion 10′ and held in place by means of screw 105; such disk being readily formed or cut from sheet insulating material. Chamber C houses distributing cables and hence has a plurality of openings, as shown at 106.

Rotatably mounted in the walls of chamber A is a shaft 11 which is preferably of non-magnetic material and arranged to support the rotor structure of the present magneto-electric machine, together with other moving parts. The rotor is shown as comprising a pair of oppositely disposed supporting plates 12 and 12′ which are preferably of magnetic material and spaced apart and rigidly secured on shaft 11 in any suitable manner, for example, by keys 13. The proper spacing is advantageously insured by means of an interposed collar 14 of non-magnetic material that is slipped over the shaft 11 before the supporting plates are put in place. The shaft 11 is preferably reduced at its ends and the shoulders threaded for the reception of securing means, such as a nut and washer, denoted respectively 15 and 16, and shown in engagement with the shoulder. The reduced ends of the shaft 11 are slipped into suitable bearing means, for example, antifriction bearings, as shown at 17, each bearing being supported in suitable recesses in the casing walls 101 and 102, the former advantageously having removable portion or closure 103 that carries the bearing. The wall 102, i. e., the one which separates the chambers A and B, has an integral portion recessed for the reception of one bearing. Closure 103 advantageously has a hub portion 19 recessed to receive not only the bearing but also an oil-seal 18 that operates to exclude oil or lubricant which otherwise might pass inwardly from the engine casing.

By the present invention, the supporting plates 12 and 12′ are adapted to support localized fields of induction and are designed to provide the number of magnetic circuit elements needed to induce the desired number of sparks for firing the multi-cylinder engine for which the magneto is provided. Accordingly, plates 12 and 12′ are arranged to carry the magnetizing means which, in the modification of the invention shown in Figs. 1 to 7, comprises a plurality of bar magnets 21 arranged to be slipped through suitable openings in plates 12 and 12′, such openings being preferably in register with, or in lines parallel to the axis of shaft 11. The bar magnets in such arrangement are all disposed with their like poles at one end, for example, the bar magnets 21 are shown in Fig. 1 with all north poles at the left, and all south poles are at the right. The bar magnets advantageously have a length such that the poles extend through or project beyond the sides of plates 12 and 12' a desired distance. While the bar magnets 21 may have substantially any desired cross-section, a circular cross-section makes for ease of manufacture and assembly; circular cross-sections are accordingly shown.

The projecting ends of the bar magnets are each associated with or enclosed in magnetic flux directing shoes 22 and 22'; such shoes being preferably composed of laminations, as illustrated, and secured to plates 12 and 12' respectively. While substantially any suitable means may be employed for securing the shoes to the supporting plate, a convenient means comprises an outer facing plate 23 that fits down over the ends of the bar magnets to prevent displacement, the whole being advantageously secured by means of rivets as shown at 24. By such an arrangement, it is seen that the shoes, together with the bar magnets, provide a series of U-shaped portions of a magnetic circuit in which the base portions of the U's are parallel and arranged to be displaced laterally; the shoes directing the flux outwardly in a radial direction about the rotor. In such an arrangement, the bar magnets 21 are advantageously made of a suitable alloy which has a relatively high retentivity, for example, of the alloy known under the trade-name "Alnico," which is capable of receiving and retaining magnetization in a relatively high degree. The laminations of the shoes 22 and 22' are of magnetic material, such as transformer iron, that has a relatively high permeability and saturation value. The laminations when assembled in a stack are insulated from one another by suitable insulating material, for example, by surface oxides, varnishes; and the like, whereby eddy currents and iron losses in the magnetic circuit may be reduced. The facing plates 23 may or may not be of magnetic material, as desired.

The shoes at their outer circumferences are notched or cut back to provide a plurality of alternate poles and gaps, for example, as shown at 22 and 22× about the serrated periphery in Fig. 2. By thus notching or cutting back the shoes at their peripheries, the desired number of localized fields of induction are provided. The number of localized fields of induction here shown as provided is that corresponding with the number of cylinders in the engine which are to be fired, for example, twenty-four.

To provide a dual ignition system in accordance with the invention, two windings, or two sets of windings, as the case may be, are disposed in inductive relation to the magnetic circuits in chamber A, for example, the sets or coils 25 and 25'. Such coils are preferably disposed stationarily with respect to the portions of the magnetic circuits which are displaced by rotation of the rotor and are disposed at suitable points about the inside cylindrical wall of chamber A, for example, at substantially diametrically opposite points. This is especially advantageous when the number of cylinders in the engine to be fired is an even number. In Figs. 1 and 2, the inductively arranged coils 25 and 25' are shown each on a core member at 26 and 26' respectively; such cores being preferably laminated.

To support coils 25 and 25' in a stationary manner in the chamber A, casing 10, which is also preferably of non-magnetic material, is shown formed interiorly with anchoring means 20 for the core ends which preferably extend beyond the end faces of coils 25 and 25'. The anchoring means provided may, of course, have any convenient form, for example, that of shoulders, as shown, formed by die casting about complementary shoe members 27 and 27' that are notched, as at 28, in order to be locked in place in the casing, and have rivets 29 for retaining the laminations of each shoe in stacked relation. Clamps, as shown at 30 and 30', may also be employed for removably retaining the cores 26 and 26' with their coils 25 and 25'.

Shoe members 27 and 27', together with core members 26 and 26', are seen by this arrangement to provide U-shaped portions of magnetic circuits which are adapted to cooperate with those on the rotor which admit of maximum flux through the coils 25 and 25' whenever a tooth on the rotor is under a tooth on the members 27 and 27'; the sets of teeth thereon being preferably arranged with equal angular spaces therebetween.

The coils 25 and 25' may, of course, employ any suitable arrangement of windings. An arrangement using a primary wound closely around the core and an outer secondary, however, is preferred. An electrical system of a character suitable to cooperate with such windings is diagrammatically shown in Fig. 12 which depicts a circuit suitable for the magneto-electric machine of the present invention. Here the primary is denoted 251 and the secondary 252, the windings being indicated as having a common ground at one end through a conductor 253. Such conductor is depicted in Fig. 1 as grounded on the cores, the conductors being denoted 253 and 253', respectively. From the other end of primary 251 a conductor 254 leads to a suitable breaker mechanism disposed in chamber B; for example, that shown therein comprising a vibratorily mounted arm or blade 40, cooperating with contacts 35 (see Figs. 1 and 3), having an actuating follower 31 and driving cam 50 that is made fast to an end of shaft 11 in chamber B. While, of course, any suitable breaker may be used, the arrangement here shown by way of example is that disclosed in copending application, Serial No. 350,533, filed August 3, 1940, in the name of L. H. Scott. The breaker mechanism is shown in Figs. 1 and 3 where the end of blade 40 remote from the follower is mounted on an abutment or base 41 projecting outwardly from casing wall 102. Blade 40 is grounded and engages with contacts 35. Electrically connected in parallel with the contacts 35 is a condenser 255, one side of which is grounded (see Fig. 12). There is a breaker for each of the circuits which include coils 25 and 25', respectively. Accordingly two breakers are shown mounted on wall 102. The arms or blades of the two breakers are denoted 40 and 40', the mounting abutments 41 and 41', the pair of contacts on each being denoted 35, while the conductors which lead thereto are denoted 254 and 254', and their associated condensers, by 255 and 255'. These latter are secured in place on wall 102 by clips 42 and 42', respectively. Conductors 254 and 254' are passed through the wall 102 from the windings by bushings 33 and 33' which preferably have relatively tight fit on the conductors passed.

From the other terminal of each secondary winding, as shown at 252 in Fig. 12, there leads another conductor 256 to a distributing mechanism which is preferably disposed in the same chamber as the breakers and has one or more electrodes rotatively arranged for transferring the high tension current selectively to stationary electrodes in bushings which anchor cables connected respectively to the spark plugs in the engine cylinders which are to be fired. Conductor 256 is shown as led through the wall 102 by means of an elongated insulating bushing or tube 93. In order to support the rotating electrode or electrodes in proper synchronism with the engine and with the rotor of the magneto, such electrode or electrodes are advantageously mounted in a suitable insulating carrier that is secured to shaft 11.

A preferred form of distributing mechanism has an insulating carrier or plate denoted 60, in Figs. 1 and 4. Such plate is preferably secured to the end of shaft 11 in chamber B at a point outwardly beyond cam 50 by means of a spider 70. Plate 60 has one rotating electrode at 65 which is charged from the windings of coil 25, and another at 65′ charged from the windings of coil 25′. Plate 60 carries in addition a plurality of charge collecting means or devices, with working surfaces exposed and opposing the disk 100. Here, there are three such devices, namely, those denoted 61, 62, and 63, only two being needed for distributing the current for dual ignition, the third being arranged to provide a booster spark, as hereinafter explained.

The device at 61 consists of a centrally located contact which engages with a resiliently pressed terminal 66 in an insulating bushing 67 that is mounted in and held stationary by disk 100. The bushing 67 provides anchorage for the conductor 256 which is secured in conducting relation with the terminal 66.

Electrical connection is established in plate 60 between contact device 61 and electrode 65 by means of a conductor 64 that is bar-like and preferably embedded in the plate 60, such conductor being here extended beyond the edge of plate 60 and arranged to serve as a support for the electrode 65. Such electrode here preferably has an oppositely extending needle-point electrode 69 arranged to terminate a desired distance from wall 102, which is a conductor, and thereby provides a safety gap across which arcs, caused by excessive potential, may strike and pass to ground. Electrode 65, which may be flat topped, revolves with plate 60, and cooperates with a series of similarly shaped stationary electrodes 72 disposed about the periphery of plate 100. The number of stationary electrodes 72 correspond to the number of cylinders to be fired and are arranged in the outermost circle in plate 100, and have the cables for ignition lead from the rear of the plate in order that they may be convenient and free from interference with magneto parts. Each electrode 72 is supported in a suitable insulating bushing 80 that has a receptacle providing anchorage for a distributing cable, for example, that shown at 257 in Fig. 12, leading to a spark plug in an engine cylinder to be fired.

The contact device 62 provides a similar distributing mechanism that furnishes the other spark for ignition in each engine cylinder. Device 62 is in the form of a conducting ring embedded in insulating plate 60 but arranged to be concentric with the device 61. Ring device 62 is arranged for current collecting purposes and engages with or wiped by a flexible brush or terminal 66′ that is in bushing 67′; this latter being also stationarily mounted in disk 100 and providing anchorage for a conductor 256′. This latter is similar to that at 256 and leads from the other magneto winding.

Another bar-like conductor 64′ is embedded in plate 60 but has no protruding end. Instead, it terminates in the plate 60 and has an electrode 65′ that is similar to that at 65 but which is at a radial distance different from that at 65 (in the illustration the distance is less), and hence is adapted to cooperate with another set of fixed electrodes 72′ on disk 100 with gap intervening and arranged peripherally and staggered to be at a less distance from the center than those at 72. Electrodes 72′ also correspond in number to the number of cylinders to be fired; their connection being in the order in which the cylinders are fired, as is the case for electrodes 72.

The third contact device 63 is arranged to provide the booster ignition system which is used when starting airplane and similar motors. The booster ignition system, however, may be dispensed with where other systems of starting are provided. The contact device 63 is in the form of another annular conductor embedded in plate 60 and arranged to be concentric with the device at 61. This third device collects high tension current from a source (not shown in the drawings in the interests of clearness). To this end, a conductor 260 is shown as leading from such source (indicated symbolically in Fig. 12) into the chamber C through a bushing 261 which is passed through the chamber wall to the rear of disk 100 (or that part remote from the magneto proper) and leads to and is anchored in a bushing 267 (which may or may not be similar to that at 67) that is preferably mounted in disk 100 on the same side and in the same manner as bushings 67 and 67′. Bushing 267 has an electrode 266 that is similar to that at 72 and terminates at a little distance from the plane of and in line with the edge of the conducting ring 63. By this means, the ring 63 is charged with a high tension current that is at a voltage materially higher than that generated in the windings at 25 and 25′ when low cranking speeds prevail. Another bar-like conductor 74, embedded in the plate 60 and displaced angularly from conductor 64′ (or from 64) to achieve a desired retardation of the firing at starting, leads radially outwardly and terminates in a prong-like electrode 78 that extends transversely through the face of plate 60 to an exterior point that is adapted to cooperate with one set of the stationary distributing electrodes, in this instance, the electrodes 72′; it being obvious that the stationary distributing electrodes 72 could equally well have been chosen. By this means, when the engine is starting and the sparks from the magneto are weak, the ignition system may be switched to the booster system to obtain strong sparks.

Casing portion 10′ is preferably made removable from the magneto proper. Access is hence readily had to the breaker and distributor mechanisms when desired. Since corrosive gases, such as ozone and nitric oxide, are formed by the action of electric sparks, the provision of the separate chamber is seen to serve as means for substantially excluding such corrosive substances from the chamber A which houses the coils 25 and 25′ and the elements of the magnetic circuits.

To insulate properly the current carrying conductors, especially those carrying high tension current, the interior cylindrical wall of chamber B is covered with suitable insulating material, which is also preferably acid resisting. A covering of this character for the cylindrical wall of chamber B is shown at 75. Through openings 106 which are in chamber C and at the rear of disk 100, are led the cables or conductors, such as 256 and 257, which distribute ignition energy to the engine. In order that these latter conductors may be anchored in disk 100 and connected with their proper stationary electrodes 72 and 72', suitable bushings therefor are provided in disk 100 which incorporate suitable anchoring means. A suitable bushing formed for both supporting electrodes and for providing cable anchorage is that shown by way of example in copending application, Serial No. 336,421, filed April 2, 1941, in the name of L. H. Scott, one form of which is depicted in Fig. 1. Such bushing is shown at 80 made of suitable insulating material, and may have its outer surface corrugated or petticoated and provided with a bore closed at one end by a perforated conducting block or plug 81 which is preferably threaded and adapted to engage with a corresponding thread on the shank of an electrode 72.

The cable to be anchored in a bushing at 80 is cut off "square," i. e., in a plane at right angles to the cable, and provided with a conducting cap which, when the cable is anchored, is in conducting relation with the cable and is preferably threaded or otherwise formed to engage positively with the threaded tip of the shank of an electrode 72.

When the threaded shank of an electrode 72 is passed down through block 81, it is then screwed into the cap 82, and draws the cable firmly into place; lock nuts and/or washers being preferably disposed over the shank and interposed between an electrode 72 and the top of a bushing 80 for locking the parts in place when the desired adjustment has been attained. By this means a quick and secure anchorage for all of the engine cables, and/or other conductors, leading to disk 100 may be had.

The magneto casing may, of course, be constructed of any suitable material. A light metal, such as aluminum, is preferred, as it shields the magneto windings to prevent radio interference and contributes to a light-weight magneto which is desired in the field of aviation. The casing 10 preferably follows the contour of the parts housed. The portions of the casing which envelop the rotor are hence cylindrical but those which house the coils 25 and 25' are enlarged and elongated, as shown at 90 and 90', in order to clear properly the high tension windings. Each of these portions is substantially rectangular in cross-section and has closures, as at 91 and 91' respectively, secured thereto.

In practice, the shaft 11 is coupled through its projecting end 104 which may be fluted or toothed to engage with a coupling device by which driving force is transmitted from the engine to the magneto. Any suitable coupling may be applied at the end 104 and may include means for close adjustment of the angular relation between the driving shaft and the shaft 11. In the form of the invention shown the magneto is intended to be driven at one-half the engine crankshaft speed for a four-cycle engine.

When the desired phase adjustment has been achieved, the starting of the engine transmits driving force to the shaft 11 which simultaneously rotates the magneto rotor carrying the magnetizing means comprising the bar magnets 21, together with the breaker drum 50 and the distributor plate 60.

The magnetic flux engendered by the magnetizing means is seen to be passed by the shoes 22 and 27 through the cores of the coils 25 so that the magneto windings 251 and 252, shown in Fig. 12, are cut by flux. As the rotor rotates, it is seen that a series of poles of localized induction pass under each shoe by which air gaps of varying width are periodically moved into and out of the magnetic circuit, causing a periodic fluctuation in the number of lines of magnetic flux passing through the cores of the surrounding coils. This periodic variation induces in the well-known manner a periodic current of corresponding frequency in the primary winding 251 of each coil. A secondary current in each winding 252 is generated by the quick change of the flux when the primary current is interrupted, such secondary current being of a relatively high potential and adapted to discharge across the spark gap in an engine cylinder. The distribution of the current from an electrode 65 when adjacent an electrode 72 is accompanied by a spark that jumps across the gap between an electrode 65 and an electrode 72. As electrode 65 is on the distributor plate 60, it rotates with the shaft 11, and thus passes successively over the outermost stationary electrodes that are disposed about the circumference of disk 100. In this way, the several cylinders comprising the engine are fired in the proper sequence. It is seen that the coil 25' similarly provides current to the electrode 65' which cooperates with the series of electrodes 72', to provide the other of the dual sparks.

By the present invention, it is seen that relatively large bearings may be provided for the shaft 11 with the result that bearing trouble is substantially eliminated in the arrangement of the present invention. The fact that the breaker is positively driven in the double-acting cam 50 also results in a positive make and break which maintains its uniformity in character no matter what the engine speed may be. The rotating safety electrode at 69 on plate 60 substantially avoids the maintenance of such arcs as may strike to ground in the chamber B, since this requires constant ionization of new paths, which is unlikely. Incident corrosive products are also substantially excluded from chambers A and C by the segregation thus provided by the present invention.

It will be seen further that, by the placing of the north poles of the magnetizing means all at one end of the rotor, the direction in which the current is passing when the transient condition occurs is always the same, with the result that as the engine increases speed, with the sparks crowded into smaller and smaller periods of time, any overlapping in the periods which may take place at high speeds does not operate to nullify the spark impulses. Hence degradation of the spark is seen to be substantially avoided.

While a plurality of permanent magnets, such as shown at 21 in Fig. 1, may be employed as the magnetizing means of magnetos provided in accordance with the present invention, such permanent magnets being carried by supporting plates 12 and 12' of magnetic material, it is by no means necessary that the magnetizing means be a plurality of permanent magnets, since a single permanent magnet may be employed and arranged as a common magnetizing means to supply flux to the pole shoes which guide the flux and provide the plurality of localized fields of induction. A hollow cylindrical magnet, made of a suitable magnetic alloy, may be employed. An arrangement of this character is shown in Figs. 8 and 9. Here, a casing 110, which may be similar to that shown at 10, and made of aluminum, has a nonmagnetic rotating shaft 111 mounted therein in bearings 117, the shaft carrying supporting members 112 and 112'. The latter are shown as spaced apart by a bushing 114. Casing 110 is also shown with a removable cover portion 113. This latter may be removed in order to afford access to the interior.

To provide a single magnetizing means for the several localized fields of induction as here proposed, a single cylindrical permanent magnet 221 is disposed about the shaft 111 and secured at the ends between the supporting plates 112 and 112'. The latter are preferably of magnetic material. Each of the supporting plates 112 and 112' may be shouldered for the reception of magnetic shoe members; such shoe members are composed of laminations 222, although laminations may be dispensed with. The shoe members shown are arranged to cooperate with similar magnetic shoe members 127 and 127' which are disposed in the stator or frame of the casing 110. The shoe members 127 and 127' cooperate to support core elements 126 which pass respectively through the center of the sets of coils, as shown at 125. Each core and coil is here mounted in substantially the same manner as shown in the modification of Fig. 1.

A separable casing portion 109 here provides the chambers, heretofore denoted B and C, and houses the breaker and distributor mechanisms and cables respectively. The breaker mechanism is here shown in identically the same form as in Fig. 1, and is operated by a double-acting cam drum 58 secured on the end of shaft 111. This shaft also supports a spider 70 which has a distributor plate 60 provided with distributing conductors and electrodes as shown in the first form of the invention.

In this second form of the invention, the casing also has a stationary terminal carrying insulating member or disk 100 which divides a casing portion 109 into forward and rear chambers, the latter housing the cables, which enter by way of tubular extensions 107 and 108.

In this form of the invention, the magneto is also adapted to be directly mounted on the internal combustion engine for which ignition is to be supplied. In such magneto, it may be desirable to incorporate the booster. To this end, one of the stator coils, such as the upper coil 125 on a core 126, is arranged to be in commission at starting also and has a magnetically actuated vibrator 120 for making and breaking the circuit of the primary of the coil at 125 during the starting period.

The vibrator 120 is conveniently disposed in the casing 110 on the stator structure in a manner completing a magnetic circuit through the core 126 when the primary of coil 125 is energized, the general arrangement being one in which shoes 127 and 127' are bridged by the vibrator, as shown in Figs. 10 and 11. Such vibrator comprises a resilient magnetizable element 121 arranged to span the stator structure for completing the local magnetic circuit indicated. The free end of element 121 has a contact 122 that may also serve as mechanical loading and contributes to the desired timing of the period of vibration. The other end is made fast to the shoe structure as shown at 123. A conducting element 250ª secured to the stator is provided with a cooperating contact which is engageable by contact 122; the element 121 being a conductor as well as a magnetizable element is conductively connected to conductor 254.

The windings of the selected coil 125 are preferably connected for service during such period by means of a suitably arranged electric circuit or system, for example, that shown in Fig. 13. Here, the primary and secondary windings are denoted 251 and 252 respectively, as in Fig. 12, the windings having a common ground at 253. Conductor 254 leads from the other terminal of the primary to the breaker at 40 and has condenser 255 in parallel with the breaker contacts; there being a grounding conductor 240 which has conductor 254 and a grounding switch 241 in series.

In this arrangement, a conductor 250 is led from conducting element 250ª to a second switch 242 that has a D. C. source of E. M. F., such as battery 243, in series with it. The conductor 250 is also preferably provided with a current limiting resistance, as shown at 245. The second switch is adapted to energize the vibrator 120 when starting.

In operation, when the engine and the magneto connected thereto are not running, switch 241 is normally closed but opened when starting or running. Switch 242 is open except when starting. When it is desired to start the engine, switch 241 is first opened, then switch 242 is closed. A circuit is then seen to be established including winding 251 and ground through which current from the battery passes, provided the breaker at 40 is open. Current passing in winding 251 energizes it so that the vibrator 121 operates to make and break the circuit and produce a high tension voltage which passes through conductor 257 to fire an engine cylinder. This booster spark causes the engine to fire, turning over at first slowly but soon fast enough to generate a proper voltage in the magneto windings which is of sufficient magnitude to fire the engine without the aid of a booster. The switch 242 is then opened and normal operation ensues.

In the event breaker 40 is not open when switch 242 is closed at starting, current from battery 243 is short circuited to ground. To prevent a surge of current at such time, conductor 250 preferably has in series with it a current limiting means, such as the resistance 245. By this means excessive current values are avoided and the battery 243 protected. The instant the breaker 40 opens, winding 251 is in operation and a booster spark provided. This is seen to insure proper timing with the engine so that danger of prematurely firing the engine is avoided by incorporating the booster in the magneto in accordance with the invention.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a magneto-electric machine, the combination comprising a casing formed with segregating chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on

said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of portions of magnetic circuits are provided, a cooperating magnetic circuit portion including a core disposed in said stationary structure, magneto windings on said core, breaker and distributor mechanisms in a second chamber including rotatable elements rigidly secured in a desired phase relation on said shaft, an insulating disk stationarily mounted and arranged to close said second chamber; and electrode supporting bushings, adapted to provide anchorage for distributing cables, demountably disposed on said disk in said second chamber and arranged to receive cables from without said second chamber.

2. In a magneto-electric machine, the combination comprising a casing formed with three segregated chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of laterally displaceable portions of magnetic circuits are provided, a cooperating magnetic circuit portion including a core disposed in said stationary structure, primary and secondary magneto windings on said core, a breaker mechanism connected in the circuit of said primary magneto windings and disposed in a second chamber, a distributor mechanism having a terminal connected in the circuit of said secondary magneto windings and disposed in said second chamber, elements of said breaker mechanism and said distributor mechanism being mounted to rotate with said shaft and secured in a desired phase relation thereto, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber.

3. In a magneto-electric machine, the combination comprising a casing formed with three chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of laterally displaceable portions of magnetic circuits are provided, a cooperating magnetic circuit portion including a core disposed in said stationary structure, primary and secondary magneto windings on said core, a breaker mechanism having a breaker arm connected in the circuit of said primary magneto winding and disposed in a second chamber, a distributor plate having a terminal connected in the circuit of said secondary magneto winding and disposed in said second chamber, a cam on said shaft arranged to drive positively said breaker arm in two opposite directions, said distributor plate being also secured to said shaft and in a desired phase relation, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber.

4. In a magneto-electric machine, the combination comprising a casing formed with three chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of laterally displaceable portions of magnetic circuits are provided, a cooperating magnetic circuit portion including a core disposed in said stationary structure, magneto windings on said core, a breaker mechanism for said magneto windings disposed in a second chamber having a breaker arm mounted on a dividing wall, a cam on said shaft for actuating said breaker arm in two opposite directions, a distributor plate on said shaft in said second chamber and provided with a terminal, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber.

5. In a magneto-electric machine, the combination comprising a casing formed with three chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of laterally displaceable substantially U-shaped portions of magnetic circuits are provided, a cooperating substantially U-shaped magnetic circuit portion including a core disposed in said stationary structure, magneto windings on said core, a breaker mechanism for said magneto windings disposed in a second chamber having a breaker arm mounted on a dividing wall, a cam on said shaft for actuating said breaker arm in two opposite directions, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber, said second chamber having an insulating lining disposed therein and spaced from said bushings.

6. In a magneto-electric machine, the combination comprising a casing formed with three chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of magnetic circuit portions are provided, a cooperating magnetic circuit portion including a core disposed in said stationary structure, magneto windings on said core in the first-named chamber, a breaker mechanism for said magneto

windings in a second chamber, a cam on said shaft in said second chamber for actuating said breaker mechanism, distributor mechanism in said second chamber on said shaft, a conducting needle-point associated with said distributor mechanism and rotating therewith and arranged to discharge to a wall of said second chamber, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber.

7. In a magneto-electric machine, the combination comprising a casing formed with three chambers, a structure stationarily mounted in one of said chambers, a shaft journaled in said chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of substantially U-shaped portions of magnetic circuits are provided, a cooperating substantially U-shaped magnetic circuit portion including a core disposed in said stationary structure, magneto windings on said core in the first-named chamber, a breaker mechanism for said magneto windings on a wall dividing the first chamber from a second chamber, a cam on said shaft in said second chamber for actuating said breaker mechanism, distributor mechanism in said second chamber rigidly secured to said shaft, a conducting needle-point associated with said distributor mechanism and rotating therewith and arranged to discharge to a wall of said second chamber and provide a safety spark gap, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber, said second chamber having an insulating lining disposed therein in spaced relation from said bushings and said spark gap.

8. In a magneto-electric machine, the combination comprising a casing formed with segregated chambers, a structure stationarily mounted in a selected one of said chambers, a shaft journaled in said selected chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of magnetic circuits are provided, a pair of cooperating magnetic circuit portions rigidly mounted in said stationary structure and disposed at relatively opposite points and each including a core, said casing being arranged to have said first-named chamber provided with a wall in common with a second chamber and having elongated housings extending in opposite directions and enclosing said cooperating magnetic circuit portions, magneto windings on each of said cores, a breaker mechanism for each of said magneto windings disposed in said second chamber and mounted on said common wall, a common cam on said shaft in said second chamber for actuating said breaker mechanisms, a distributor plate mounted on said shaft in said second chamber and provided with a pair of terminals each connected respectively to the windings on said cores, a vibrator disposed to be actuated by a selected one of said cooperating magnetic circuit portions, and means associated with said vibrator for making and breaking an electric circuit in parallel with said breaker mechanism.

9. In a magneto-electric machine, the combination comprising a casing formed with segregated chambers, a structure stationarily mounted in a selected one of said chambers, a shaft journaled in said selected chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of magnetic circuits are provided, a pair of cooperating magnetic circuit portions rigidly mounted in said stationary structure and disposed at relatively opposite points and each including a core, said casing being arranged to have said first-named chamber provided with a wall in common with a second chamber and having elongated housings extending in opposite directions and enclosing said cooperating magnetic circuit portions, magneto windings on each of said cores, a breaker mechanism for each of said magneto windings disposed in said second chamber and mounted on said common wall, a common cam on said shaft in said second chamber for actuating said breaker mechanisms, a distributor plate mounted on said shaft in said second chamber and provided with a pair of terminals each connected respectively to the windings on said cores, a vibrator disposed to be actuated by a selected one of said cooperating magnetic circuit portions, means associated with said vibrator for making and breaking an electric circuit in parallel with said breaker mechanism, an insulating disk mounted in said chamber and serving as a wall providing a third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and accessible from said third chamber.

10. In a magneto-electric machine, the combination comprising a casing formed with segregated chambers, a structure stationarily mounted in a selected one of said chambers, a shaft journaled in said selected chamber, an inner structure mounted on said shaft and rotatively arranged with respect to said stationary structure, magnetizing means mounted on said inner structure together with magnetizable elements whereby a plurality of magnetic circuits are provided, a pair of cooperating magnetic circuit portions rigidly mounted in said stationary structure and disposed at relatively opposite points and each including a core, said casing being arranged to have said first-named chamber provided with a wall in common with a second chamber and having elongated housings extending in opposite directions and enclosing said cooperating magnetic circuit portions, magneto windings on each of said cores, a breaker mechanism for each of said magneto windings disposed in said second chamber and mounted on said common wall, a common cam on said shaft in said second chamber for actuating said breaker mechanisms, a distributor plate mounted on said shaft in said second chamber and provided with a pair of terminals each connected respectively to the windings on said cores, a vibrator disposed to be actuated by a

selected one of said cooperating magnetic circuit portions, means associated with said vibrator for making and breaking an electric circuit in parallel with said breaker mechanism, an insulating disk stationarily mounted in said casing and serving as a gas-tight closure for said second chamber and as a wall for the third chamber, and a plurality of electrode supporting bushings having cable anchoring receptacles, said bushings being disposed on said disk in said second chamber and arranged to have said receptacles accessible from said third chamber, said second chamber having an insulating lining disposed therein and spaced from said bushings.

11. In a magneto-electric machine, the combination with a casing having a shaft journaled therein, of inner and outer structures in said casing, the inner of which is mounted to rotate with said shaft, the outer being disposed stationarily in said casing, said outer structure being cooperatively arranged and having at least two complemental portions including a core for completing local magnetic circuits through said inner structure, magneto windings on said core, means for connecting at will said windings in an electric circuit having an external source of E. M. F., a vibratorily mounted magnetizable element arranged to complete an independent magnetic circuit through said core, and contact means associated with said element and arranged to complete an electric circuit including said windings and said source of E. M. F. when in one position and to interrupt said circuit in another position.

12. In a magneto-electric machine, the combination with a casing having a shaft journaled therein, of inner and outer structures in said casing, the inner of which is mounted to rotate with said shaft, the outer being disposed stationarily in said casing, said outer structure being cooperatively arranged and having at least two complemental portions including a core for completing local magnetic circuits through said inner structure, magneto windings on said core, an electric circuit including a switch and a ground connected to said magneto windings, other switch means for connecting a source of E. M. F. in said electric circuit in series with said ground, a vibratorily mounted magnetizable element arranged to complete an independent magnetic circuit through said core, and contact means associated with said element and arranged when in contact to complete a circuit including said windings and source of E. M. F. but when open to break said circuit whereby voltages may be induced in said windings.

13. In a magneto-electric machine, the combination with a casing having a shaft journaled therein, of inner and outer structures in said casing, the inner of which is mounted to rotate with said shaft, the outer being disposed stationarily in said casing, said outer structure being cooperatively arranged and having at least two complemental portions including a core for completing local magnetic circuits through said inner structure, magneto windings on said core, means for connecting at will said windings in an electric circuit having an external source of E. M. F., a resilient magnetizable element disposed parallel to said core and spanning the associated complemental portions of said outer structure, said magnetizable element being secured at one end to a complemental portion while the other is free to vibrate under the attraction of a local magnetic field through said core and said magnetizable element, a make-and-break device in series with said windings and said source of E. M. F. arranged to be operated by the free end of said magnetizable element, and main breaker mechanism for said magneto windings having contacts in parallel with said vibratorily actuated make-and-break device.

14. In a magneto-electric machine, the combination with a metal casing having gas-tight segregating chambers and a shaft journaled in a selected one of the same, of inner and outer structures in said selected chamber having serrated pole formations providing localized magnetic fields, said outer structure comprising a stator for said machine and having a core provided with magneto windings, magnetizing means for said rotor, mechanisms for collecting and distributing high tension current disposed in a second one of said chambers, and cables leading from said distributing mechanism in a third one of said chambers including cables adapted to lead to spark plugs of an internal combustion engine; the electrical system including collecting and distributing mechanisms and cables being housed in a continuous metallic structure whereby they are shielded against external electrical interference.

15. In a magneto-electric machine, the combination with a casing having a shaft journaled therein; of inner and outer structures in said casing; the inner of which is mounted to rotate with said shaft; the outer being disposed stationarily in said casing, said outer structure being cooperatively arranged and having at least two complemental portions including a core for completing local magnetic circuits through said inner structure; a magnetizable element vibratorily mounted and arranged to complete an independent magnetic circuit through said core and associated complemental portions of said stator; and an electrical system comprising grounded windings on said core having rotor actuated breaker mechanism including contacts connected thereto and completing the circuit through ground, a condenser connected in parallel to said contacts, a grounding switch connected to said windings in parallel with said breaker mechanism, a make-and-break device including contacts in series with said windings and arranged to be actuated by said magnetizable element, and a second grounding switch including an external source of E. M. F. and a current limiting resistance connected in series with said last-named contacts and ground.

16. In a magneto-electric machine, the combination comprising a magnetizing means, a rotor including poles forming a part of unidirectional magnetic circuits including said magnetizing means, a stator including a magneto winding and a core extending through said winding terminating in poles adapted for coincident cooperation with said rotor poles to form such magnetic circuit of low reluctance through said winding for maximum unidirectional flux linkage thereof, means for connecting at will said winding in an electric circuit having an external source of E. M. F., a vibratorily mounted magnetizable element arranged to complete an independent magnetic circuit through said core, and contact means associated with said element and arranged to complete an electric circuit including said winding and said source of E. M. F. when in one position and to interrupt said circuit in another position.

17. In a magneto-electric machine, the com-

bination comprising a rotor including a magnetizing means having poles forming a part of unidirectional magnetic circuits, a stator including a magneto winding and a core extending through said winding terminating in poles adapted for coincident cooperation with said rotor poles to form such magnetic circuit of low reluctance through said winding for maximum unidirectional flux linkage thereof, means for connecting at will said winding in an electric circuit having an external source of E. M. F., a resilient magnetizable element disposed parallel to said core and spanning complemental portions associated with said stator poles, said magnetizable element being mounted at one end adjacent to a complemental portion while the other is free to vibrate under the attraction of a local magnetic field through said core and said magnetizable element, a make-and-break device in series with said winding and said source of E. M. F. arranged to be actuated by the free end of said magnetizable element, and main breaker mechanism for said magneto winding having contacts in parallel with said circuit including said vibratorily actuated make-and-break device.

18. In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

LLOYD H. SCOTT.

BRIEF FOR APPELLEE

United States Court of Appeals

DISTRICT OF COLUMBIA

APPEAL NO. 8790

BENDIX AVIATION CORPORATION, APPELLANT

v.

CASPER W. OOMS, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

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United States Court of Appeals

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CASPER W. OOMS, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

This is an appeal from the judgment (8)[1] of the District Court of the United States for the District of Columbia dismissing appellant's complaint (1) in an action brought by appellant to obtain the issuance of a patent on the application of its assignor Jacob R. Frei, No. 360,227, which was filed in the Patent Office on October 8, 1940, and entitled "Distributor." In the complaint, allowance of claims 18, 19, and 20 (2, 3) of the application was sought, but the appeal (9) is limited to the lower court's refusal of claims 19 and 20. These claims were presented by appellant in the Frei application for the purpose of obtaining an interference in the Patent Office with the previously granted patent to Scott, No. 2,286,232, dated June 16, 1942 (53–70). Claim 19 (3) is a copy of claim 18 (70) of said patent and claim 20 (3) is substantially the same.

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[1] The numbers in parentheses refer to pages of the joint appendix.

Both examiner and the Board of Appeals of the Patent Office held (37, 42, 50) that the Frei application does not disclose the subject matter of the appealed claims and rejected them on that ground. The lower court held the rejection proper (6–8) and dismissed the complaint.

THE SCOTT PATENT

It will be convenient to consider first the Scott patent (53–70) where the appealed claim 19 originated. As noted above, claim 20 differs slightly but not materially from claim 19.

The patent relates to the magneto of an airplane engine. The magneto is shown in section in Fig. 1 (53) of the patent. The magneto casing is divided into three chambers A, B, and C. Chamber A contains the magneto coils 25, 25′. Chamber B contains the breaker mechanism consisting mainly of the rotor 60 and the stationary electrodes such as 72. The latter are mounted on the partition 100 which separates chamber B from chamber C. The latter chamber is a housing for the electric cables 256, 257, etc. which lead to the spark plugs. The patentee states (54, lines 68 to 75, second column) that the electric sparks which are produced in chamber B produce ozone and nitric oxide. These are corrosive gases which would attack the coils in chamber A and the cables in chamber C if allowed to penetrate into these chambers. The patentee therefore makes chamber C substantially gas-tight (61, lines 48 to 52, first column; 62, lines 43 to 45, first column, and lines 20 to 23, second column; 65, lines 51 to 54, second column).

This disclosure is the basis for claim 18 of the patent (70) which is the same as appellant's claim 19 (3). The claim reads as follows:

> In a high tension magneto-electric machine, the combination comprising a casing member adapted to be divided into a chamber for housing supply and distributing cables and a second chamber for housing a rotary distributing member, and a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings whereby the ends of cables housed in the first chamber may be brought into conducting relation with said rotary distributing member in the second chamber.

The first chamber, which houses the supply and distributing cables, is the chamber C, the second chamber, which houses the rotary distributing chamber, is the chamber B. The partition 100 carries the terminal mountings 80 and prevents access of gases from chamber B to chamber C.

APPELLANT'S APPLICATION

The distributor disclosed in appellant's application (23–35) corresponds in a general way to what is shown in chambers B and C of Scott. Appellant does not show the magneto which is contained in Scott's chamber A. But this fact is of no importance in the present controversy. Appellant's chambers 17 and 19 may be said to correspond in location to Scott's chambers B and C, respectively. Appellant's chamber 19, however, which contains the distributing cables 61, 62 is filled with a pliable solid, such as polymerized cashew nut shell oil 66, which is said to minimize the possibility of flash overs between the casing and the terminals 60 which might result from vibration. A further function of the filling is to prevent moisture from entering or accumulating in the chamber 19 (29). The bottom of the chamber 19 is a partition 16 formed integral with the casing. This partition, as in Scott's device, serves as a support for the terminal mountings 58. As shown and described (30) appellant's compartment 17 is vented to the atmosphere.

SUMMARY OF ARGUMENT

The Frei application does not disclose a partition adapted to prevent access of gases from chamber 17 to chamber 19, as is required by the appealed claims. In appellant's device as disclosed there is no necessity for having an airtight partition. The partition disclosed is not inherently airtight and is not described in the application as being airtight. The Frei application therefore does not support the appealed claims.

ARGUMENT

The single difference between the two appealed claims is in the introductory clauses thereof. Claim 19 calls the device a "magneto-electric machine," while claim 20 calls it an "ignition device." This difference is not considered of any importance in the present controversy. The point in controversy is whether the remainder of each claim is fully supported by the Frei application as it was filed in the Patent Office.

The particular clause in the claims which has been held by all of the lower tribunals as not being supported by the Frei application is the following:

> * * * a partition in said casing member adapted to prevent access of gases from the second chamber to the first, said partition including terminal mountings * * *.

In the device shown and described in the Scott patent (53), which is the source of the appealed claims, the partition 100 is made airtight in order to prevent corrosive gases, such as ozone and nitric oxide which are produced in chamber B, from passing into chamber C where they would attack the cables 256, 257, 260, etc. It will be noted that except for the presence of these cables the chamber C is empty. The analogous chamber 19 in appellant's structure, if it can be called a chamber, is filled completely with a suitable insulating material of a solid yet pliable nature. Since appellant's cables 61 and 62 are completely embedded in the solid insulating material 66, the corrosive gases in chamber 17 would not have access to the cables even if the partition 16 had been entirely omitted. It seems obvious that the partition 16 serves merely as a support for the body of insulating material 66 and for the terminal mountings 58. The Frei specification ascribes no other function to the partition.

Notwithstanding that there is no necessity in the Frei device that the partition be airtight and notwithstanding that Frei did not describe it as being airtight, appellant contends that it is inherently airtight as disclosed. To support this contention appellant offered in the Court below the testimony of Walter J. Spengler (10–22). By this testimony appellant endeavored to show that there would be no leakage through the partition at the points where the terminal mountings 58 pass through. The witness did not contend that the screw threaded connection of the mounting and the partition would alone prevent leakage but stated (14) that the connection as a whole is substantially air tight because the shoulder above the screw threads on member 58 rests on the partition and makes a seal. This testimony was given notwithstanding the fact that no such seal is mentioned in the Frei application. In fact, the application does not mention the shoulder at all. It seems clear moreover that the mere abutment of the shoulder against the partition would not make an airtight seal unless the abutting faces were accurately machined to provide intimate contact between them.

In connection with the testimony a model, plaintiff's Exhibit 8, was introduced (15) on which model tests had been made to show absence of leakage. However the tests were not carried out under the conditions which would normally be encountered in the practical use of the device. While undergoing the test the model was kept in the office of the witness where the temperature, atmospheric pressure, and other conditions were substantially constant. In normal use in an airplane engine the device would be subjected to extreme differences in temperature and pressure as well as to great vibration. It is submitted that the test as made was of little or no value in determining whether there would be leakage under normal operating conditions.

The witness attempted to show that the connection of the terminal 82 of the Scott structure to the screw plug 81 would allow leakage. For this purpose the witness postulated that the screw threads of Scott are truncated with the result that a small spiral opening is left between the parts when they are screwed together. The witness interpreted the Scott drawing as showing a lock washer of the split type, located under the head 72 of screw plug 81, which washer would allow leakage through the postulated spiral channel of the threads. But Scott did not so describe his screwthreaded connection and did not mention a washer. He described his partition as forming a gas-tight closure between the chambers B and C and there is no sufficient basis for assuming that the screw connection was one that would allow leakage.

It is submitted therefore that the testimony was wholly insufficient to show either that the Frei partition is airtight or that the Scott partition is not airtight.

The law is clear that when an applicant for patent copies claims from a patent already granted to another they will be refused to him unless his application as filed supports them.

The Supreme Court in *Chicago & N. W. R. Co.* v. *Sayles*, 95 U. S. 54, said:

> Courts should regard with jealousy and disfavor any attempts to enlarge the scope of an application once filed, or of a patent once granted, the effect of which would be to enable the patentee to appropriate other inventions made prior to such alteration, or to appropriate that which has in the meantime gone into public use.

That case was cited and the principle stated therein was followed by this Court in

Manley v. *Williams*, 37 App. D. C. 194, and
Cooper v. *Downing*, 45 App. C. A. 345.

This Court in *Steenstrup* v. *Morton*, 58 App. D. C. 343, 30 F. (2d) 867, said:

> * * * when an applicant attempts to copy claims from an existing patent, it is incumbent upon him to show clearly, in his specification and structure, the means for accomplishing the object called for in the claims.

Also in point are the following decisions of this Court:

Hauss v. *Merrell*, 48 App. D. C. 433.
Lindley v. *Shepherd*, 58 App. D. C. 31; 24 F. (2d) 606.
McFarren v. *Morgan*, 58 App. D. C. 77; 24 F. (2d) 1003.

The United States Court of Customs and Patent Appeals follows the same rule. In *Brand* v. *Thomas*, 25 C. C. P. A. 1053, 96 F. (2d) 301, it said:

> One who extracts claims from an issued patent must show a clear prior disclosure.

In *Hansgirg* v. *Kemmer*, 26 C. C. P. A. 937, 102 F. (2d) 212, the same Court said:

> "Where one copies a claim from an inadvertently issued patent it should clearly appear that his application disclosed the invention either expressly or inherently. He may disclose the invention by drawings, by the use of language, or he may disclose it by reciting and teaching such subject matter as will inherently do the thing or possess the quality which is claimed for it. So it is not enough to say that Kemmer said nothing about dust removal or about a screen which would remove it if the process defined by Kemmer would inherently perform the function in the manner prescribed by the count. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.

See also,

> *McKee* v. *Noonan,* 24 C. C. P. A. 784, 86 F. (2d) 986.

Appellant in its brief (Br. 8, 9, 22, 23) lays stress on the fact that the lower Court in its findings did not use the phrase "new matter." Appellant states (Br. 23) "The failure of the Court below to hold that new matter had been brought into Frei's case is conclusive of the fact that new matter was not brought into it."

There is no basis for such a contention. The lower Court found (8) that the claims at bar call for a partition in the casing for preventing access of fluid from one chamber to the other and that the Frei application does not disclose any such concept and does not support the claims at bar. This is a holding that the claims contain matter not found in the Frei application as filed, i. e., they contain "new matter." It is therefore entirely immaterial that the lower Court did not employ the phrase "new matter."

Appellant's remarks (Br. 15) concerning the last sentence of the lower Court's Finding of Fact No. 4 (7, 8) are misleading. The sentence in question is entirely accurate but it is pertinent only to appellant's claim 18 which appellant copied from another Scott patent No. 2,286,233. Appellant has acquiesced in the lower Court's refusal of this claim by failing to include the claim in the instant appeal. The sentence in question was not the basis for the lower Court's refusal of the claims here on appeal.

CONCLUSION

It is submitted (*a*) that there is nothing in the Frei application to show that he had any conception of making his partition 16 and terminals airtight so as to prevent access of gases from chamber 17 to chamber 19, (*b*) that there is in his device no necessity for having an airtight partition, and (*c*) that his partition and terminals are not inherently airtight.

Consequently it is submitted that the lower Court properly held that appellant is not entitled to make the appealed claims in the Frei application, and properly dismissed the complaint.

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SEPTEMBER 1945.

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REPLY BRIEF FOR APPELLANT

IN THE

United States Court of Appeals

DISTRICT OF COLUMBIA.

No. 8790

BENDIX AVIATION CORPORATION, *Appellant,*

v.

CASPER OOHMS, Commissioner of Patents, *Appellee.*

Appeal from a Judgment of the District Court of the United States for the District of Columbia.

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Appeal from a Judgment of the District Court of the United States for the District of Columbia.

REPLY BRIEF FOR APPELLANT.

THE INHERENT CAPACITY OF APPELLANT'S STRUCTURE.

a. The Critical Question of Fact.

The brief for appellee has materially simplified the consideration of this case by inherently eliminating all questions of fact save one, viz: Whether the partition of Frei is inherently adapted to prevent the passage of gas from chamber to chamber of the casing.

The law of the case may well be stated thus: If one of two identical structures will perform a function, it may be presumed that the other will perform in like manner.

The partition of patentee Scott has two joints through which gas might pass from one chamber of the casing to the other, the screw threaded terminal joint 67, and the shelf joint where the edge of the partition 100 rests upon a ledge on the inner wall of the casing.

The partition of appellant Frei has only one joint through which gas might pass, the screw threaded terminal joint 63. The partition itself is integral with the wall and has no shelf joint such as Scott's.

Gases will not pass through the solid part of Frei's partition, or through the solid part of Scott's partition, but can only pass through the joints. By eliminating Scott's shelf joint, Frei made his structure better adapted to prevent the passage of gas than Scott's.

There remains to be considered, therefore, only the question whether the screw threaded terminal joint of Frei will prevent the passage of gas as alleged for the screw threaded terminal joint of Scott.

The screw threaded terminal joints of Frei and Scott are identically mounted in the partition. Each is screw threaded into the partition and each has a shoulder that rests upon the partition. Since the structures are identical, they must act alike. In other words, the structure of Frei is inherently adapted to perform the selfsame functions that are performed by the structure of Scott. From the very laws of nature, identical structures must operate alike. It is not to be presumed that identical structures will operate differently, and any evidence or argument to that effect should be regarded with the gravest suspicion.

There is no evidence in the case to support appellee's contention that these identical structures operate differently. All the evidence (Joint Appendix, page 10 et seq.) supports the natural conclusion that these identical structures do in fact operate identically to prevent the passage of gas.

b. The Authority Cited by the Commissioner-Appellee is Inapplicable.

The law is well stated in the case of *Hansgirg* v. *Kemmer*, 26 C. C. P. A. 937; 102 Fed. 2nd 212, on which the appellee, incomprehensibly, relies. It will be explained hereinafter that it requires nothing but the application of the principles stated therein to establish the appellant's cause, but the facts of that case are not similar to this situation.

That case dealt with the making of magnesium. In the making of magnesium it is customary to mix magnesium ore with a reducing agent such as ferrosilicon and to form the mixture into briquets with a binder; at appropriate temperature and pressure the magnesium ore is reduced, the liberated magnesium is vaporized and passes to a condenser. Hansgirg placed a screen between the magnesium evaporator and the condenser in order to remove dust particles from the vapor. The party Kemmer had no such screen, completely lacked an equivalent element, and demanded an interference on an unsupported allegation that the vaporized magnesium was filtered by the binder in the briquet. His demand was denied because he had neither the precise element nor an equivalent element. No such far-fetched and unreasonable contention is being made by the appellant. Appellant lacks no structure that is shown by the patentee, Scott.

The case of *Lindley* v. *Shepherd*, 58 App. D. C. 31, involved a case of different constructions, not of identical constructions. The separator sheet of one party was described as wood. The separator sheet of the other party was not described as to the material of which it was made. It was essential that the first party's separator should be of insulating material. The second party attempted to insert in his specification a description of the material of which his separator was made. The single claim in issue called for material embedded in the plate, and the court pointed out that if the appellant had had embedded material in his plate, it would have rendered the device inoperative (page 607, first column, line 3). That case involves only a decision upon the particular facts; it does not involve a principle of law contrary to the rules which are set forth elsewhere herein and in appellant's brief.

McFarren v. *Morgan,* 24 Fed. 2nd 1003, 58 App. D. C. 77, was another case which turned upon the particular facts and stated no general rule of law. It had to deal with coal mining and had no relation to the facts or principles at issue in this case.

The decision in *Brand* v. *Thomas,* 25 C. C. P. A. 1053; 96 Fed. 2nd 301 includes *in addition to the portion quoted in appellee's brief* these words: "Where an applicant for a patent discloses in his application a device that must inherently do a certain thing, he necessarily discloses that function or that thing, even though he says nothing concerning it." In principle, that case supports the appellant's position, not the appellee's. As to facts, it related to two adding machines which, according to the court, operated on radically different principles. There is no semblance between the facts of that case and the facts of this.

Steenstrup v. *Morton,* 58 App. D. C. 343; 30 Fed. 2nd 867, was another case decided on its own facts. According to the court (page 869) one party had automatic means for moving the welding head of a welding machine with respect to the work, and the other party totally lacked such means. The two structures were not identical, as they are in this case. The cases of *Chicago & N. W. R. Co.* v. *Sayles,* 95 U. S. 54; *Manley* v. *Williams,* 37 App. D. C. 194; *Cooper* v. *Downing,* 45 App. D. C. 345; *McKee* v. *Noonan,* 24 C. C. P. A. 784; 86 Fed. 2nd 986, likewise deal with situations decided upon their own particular facts, which lacked identity of structure, or with situations in which there had been an insertion of new matter. None of the facts therein stated are pertinent to the issues here.

THE RED HERRING OF ERROR.

a. The Filler and the Fact.

On page 4, line 3, of appellee's brief is found the following statement: "Appellant's chamber 19, however, which contains the distributing cables 61, 62 is filled with a pliable solid, such as polymerized cashew nut shell oil 66, which is said to minimize the possibility of flashovers between the casing and the terminals 60 which might result from vibration."

Thus, an extraneous red herring is dragged across an otherwise clear trail; cashew nut shell oil is neither excluded nor included by the claims in issue, and ought never to have been mentioned.

Appellee's statement, furthermore, is not an accurate presentation of fact because it implies that the appellant described the use of the pliable solid as essential.

The question is not what is in applicant's specification, but what is in the patented claims.

Appellant's specification, still further, is not limited to an upper chamber filled with cashew nut shell oil, but describes such a filler as merely "*preferable*" (Joint Appendix, page 29, line 27). The use of the term "preferable" indicates that it is not essential and may be omitted.

The same error also appears elsewhere in appellee's brief. On page 5, line 20, it is stated that: "The analagous chamber 19 . . . is filled completely with a suitable insulating material . . . Since appellant's cables are completely embedded . . . the corrosive gases . . . would not have access to the cables even if the partition 16 had been entirely omitted."

In leaning so heavily upon the filler the appellee commits the same error which appeared throughout the prosecution below: he drags into the discussion an extraneous element which is not in the claims. Inspection of the claims shows that they do not call for a filler. Neither do they exclude a filler. They call only for a casing, and they call for it in terms that read upon appellant's casing. Scott, the patentee, could use a filler in his upper chamber without affecting the meaning of the claim. It is submitted that the case must be decided upon a basis of what is actually recited in the claims and that to imply that the claims include or exclude matter found only in one or the other specification is error. Words of exclusion are lacking. Either party could use a filler without affecting the meaning of the claim one iota. The criterion is identity of the subject matter *claimed.* The presence of additional features in either application is wholly immaterial.

The present position adopted by the Commissioner of Patents states in effect that the right to interference will be denied if the appellant's specification or drawings disclose additional features beyond those recited in the claims at issue. It is submitted that the Commissioner's position is bad law. The fact that the appellant Frei had the additional concept of a plastic filler to support the wires in one chamber is totally unrelated to the question whether he originally disclosed the simple structure recited in the copied claims.

b. Matter Described as "Preferable" Cannot be Construed as Essential.

The findings of fact (Joint Appendix, pages 6, 7, 8) hold in effect that plaintiff is limited to a construction in which the chamber which contains the distributing cables is filled with a solid insulating material. That error is found in findings 2 and 4.

The court, thus, held that features of construction which the specification describes only as preferable, are an essential part of the invention.

When that proposition was first presented by solicitor for appellee, counsel showed it to be unsubstantial and unreasonable. It was with surprise that counsel read of the adoption by the district court of that error.

The law is settled that features of construction which a specification describes as preferable do not thereby become essential parts of the patent or limitations of the claims. It may be stated categorically that there is no respectable authority to the contrary.

A leading case is that of *Sewell* v. *Jones,* decided in 1875, in the Supreme Court of the United States (91 U. S. 171). It concerned a patent, which claimed the canning of corn, in which the patentee Winslow wrote, "I recommend the following method." It was urged that the method constituted a limitation, but the court said: "This is not of the substance of the patent. A recommendation is quite different from a requirement. The latter is a demand, an essential, a necessity, the former is a choice or preference between different modes or subjects and is left to the pleasure or judgment of the operator."

Another important case dealing with the same point was that of *Westinghouse Electric & Mfg. Co.* v. *Union Carbide Co.,* 112 Fed. 417, decided November 11, 1901. That case bears a singular relation in its facts to this case. The Westinghouse patent stated that it may be preferred in some instances to surround the transformer of the invention with oil or paraffin or other suitable material. It was maintained by the defendant in that case as it is maintained by appellee in this case that the oil was positively included and an essential part of the invention. The patentee insisted, as the appellant does, that the use of a filler was a matter of preference, of recommendation only, and did not constitute an essential feature of the patent. The court held it to be quite true that a feature which is mentioned only by way of recommendation is not an essential part of the patent, citing *Sewell* v. *Jones, supra; Holliday* v. *Pickard,* 29 Fed. 853, and others to the same effect.

Other decisions in conformity with this principle of law are *Smeeth* v. *Perkins & Co.,* 125 Fed. 285, first syllabus, where the court held "Features of construction which the specification of a patent recommends or describes as preferable do not thereby become essential parts of the patent or limitations of the claims." *Rollman Mfg. Co.* v. *Universal Hardware Works,* 207 Fed. 97, second syllabus; and *Theroz Co.* v. *United States Industrial Chemical Co.,* 14 Fed. 2nd 629, are in conformity.

It is therefore seen that the decision of the court below is in violation of an established rule of law which has been maintained without variation almost since the founding of the patent law. It was reversible error to hold that the appellant was limited to the employment of an insulating medium in the chamber that contained the cables.

THE LACK OF EXPRESS WORDS TO DESCRIBE A PARTICULAR FUNCTION.

a. The Fact.

The appellee objects that the appellant Frei does not have in his specification an *express* disclosure in words of the gas sealing *function* of his partition: At the bottom of page 5 of appellee's brief that objection is thus stated: "The Frei specification ascribes no other function to the partition", thus implying that it ought to have mentioned air tightness. At the top of page 6, it is stated: "Notwithstanding that . . . Frei did not describe it (the partition) as being airtight, . . .". At the middle of page 6, it is stated: "This testimony was given notwithstanding the fact that no such seal is mentioned in the Frei application." On page 10, under "Conclusion", it is stated "(a) that there is nothing in the Frei application to show that he had any conception of making his partition 16 and terminals airtight so as to prevent access of gases from chamber 16 to chamber 19".

b. The Law on the Point.

The case of *Hansgirg* v. *Kemmer* cited by appellee demolishes appellee's position. The first sentence of that decision quoted in appellee's brief reads as follows: "Where one copies a claim from an inadvertently issued patent it should clearly appear that his application disclosed the invention *either* expressly or *inherently*. He may disclose the invention by *drawings,* by the use of language, or he may disclose it by reciting and teaching such subject matter as will inherently do the thing or possess the quality which is claimed for it.''

According to the terms of that decision, the lack of *express* disclosure in the specification is unimportant because *inherent* disclosure is sufficient, and because acceptable disclosure may be made by *drawings*. Appellant's drawing shows a method of sealing that is identical with that upon which the claims were based, and he is entitled, according to the authority cited by the Commissioner-appellee, to make these claims. It was reversible error to hold otherwise.

SCOTT DID NOT ASSERT HIS PARTITION TO BE AIR OR GAS TIGHT.

Scott, the patentee, did not even claim in his specification that his partition was gas tight. See, for instance, the statement on page 64, line 68, second column, which reads as follows: ''Since corrosive gases . . . are formed . . . the provision of the separate chamber is seen to serve as a means for *substantially* excluding such corrosive substances from the chamber A which houses the coils 25 . . .''.

A point is made in appellee's brief, page 6, line 18, that the appellant did not describe the shoulder above the screw threads of the terminal mountings. *Neither did the patentee*. Nevertheless, in both cases the seal depends upon it because all screw threads will leak gas; there is no description in Scott's specification that makes his screw thread or his shoulder any different from any other screw thread or shoulder. The description of the mounting of the terminals by screw threads in the partitions is of about the same character in both specifications. The patentee's statement on this subject is found on page 64 of the Joint

Appendix, line 33, first column, and on page 64, line 64, first column. It is no better than Frei's statement.

Inasmuch as the patentee, Scott, did not claim anything more than a substantial exclusion of gas, the tribunals erred in laying down such strict requirements for the applicant Frei. In view of the statement quoted from the Scott specification, the phrase "adapted to prevent access of gases from the second chamber to the first", found in the claims at issue, means only a substantial and not an absolute exclusion.

In *Weiss et al.* v. *R. Hoe & Co.*, 107 Fed. 2nd 722; 44 U. S. P. Q. 412, one question involved a housing which had been so arranged that it was made in the words of the patentee "airtight" to permit the use of highly volatile substances without the dangers of escape. The court said, in relation to the term "airtight", that a patent calling for an airtight housing does not demand a closure absolutely airtight; it means a closure as efficient as practically consistent with proper functioning of the machine (Syllabus 8).

The appellant has submitted more proof than he needed, because he proved what amounted to an absolute exclusion. It is perfectly obvious, since appellant's device is better adapted to exclude gases than Scott's, that the requirements of the claim are fully met.

THE PREREQUISITE SUBJECT OF NEW MATTER.

"New matter" means inserting a new element of structure in a mechanical case, or inserting a new step in a process case, after filing. We are dealing here with an apparatus invention and need not consider processes. The only way in which the question of new matter could come into the case would be by the addition to the specification or to the drawings of some new element of structure, like adding a filter to an apparatus that did not previously have one. It is not new matter to recognize an inherent function of a structure already amply disclosed (*Electric Storage Battery Co.* v. *Philadelphia Storage Battery Co.*, 211 Fed. 154).

The statement is found on page 9 of appellee's brief that the lower court found new matter. The words used are these: "that the claims at bar call for a partition in the casing for preventing access of fluid from one chamber to the other and that the Frei application does not disclose any such concept and does not support the claims at bar". Those words allege a lack of something, they do not assert the presence of something new. New matter is not a mere lack of something, it is a positive addition of new structure not present in the case as filed. Therefore, the argument of the Commissioner-appellee on this point is without basis, and the decision below is proved to have been inconsistent with the existing law and lacking in an element essential to the judgment erroneously pronounced.

CONCLUSION.

1. The partition of appellant Frei lacks the shelf joint found at the edge of the partition of patentee Scott and is therefore in this respect inherently better adapted to prevent the passage of gas.

2. The partition of appellant Frei is solid except at the mounting of the terminals in the partition; therefore, the terminal mountings offer the only possible avenue of gas passage.

3. The mounting of the terminals of appellant Frei is identical with the mounting of the terminals of patentee Scott, both being by screw thread and shoulder; therefore, if one of them will substantially prevent the passage of gas, so will the other.

4. The patentee, Scott, did not claim absolute gas exclusion, but only substantial exclusion.

5. Appellant Frei proved by evidence that his partition is gas tight, thus showing greater efficiency of sealing than required by the patent.

6. The appellant reasons thus: That his structure is identical with the structure described in the copied claims; that the mounting of his terminals in the partition is physically identical with the like structure of Scott upon which the claims depend; that the identity can be comprehended by the mere comparison of the respective drawings; that, being identical, they are inherently bound to function alike; and that the unrebutted evidence proves that they do act alike except that appellant's structure performs the function in question better than that of Scott.

7. The appellee's various charges boil down to the mere lack of *express* mention of an obvious *function* of a structure that was both shown and described in the application as filed.. That lack of express mention of the function is not objectionable according to the authority cited by the appellee.

8. The law is established that an applicant is entitled to make a claim embracing every function his apparatus will perform whether he knew about the function or not; the appellee would deny this applicant that right.

9. The court below committed reversible error as set forth in appellant's brief.

10. The appellant is entitled to relief.

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